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THE NAYADES (FRESHWATER MUSSELS) OF THE UPPER TENNESSEE DRAINAGE. WITH NOTES ON SYNONYMY AND DISTRIBUTION.

By A. E. ORTMANN, Ph.D., Sc.D.

(*Read April 19, 1918.*)

The present enumeration of the mussels of the upper Tennessee is the result of the writer's work carried on in this region since 1912, under the auspices of the Carnegie Museum of Pittsburgh, Dr. W. J. Holland, director.

It is intended, herein, to give a complete synopsis of this fauna, using the modern system, and the accepted rules of nomenclature, together with a full synonymy of the various forms, as far as it has been firmly established. Much stress has been laid upon the facts of the geographical distribution, because it has become evident that not all of the species are uniformly distributed in this area.

The latter includes all of the upper Tennessee drainage from Chattanooga, Tenn., upward, comprising largely eastern Tennessee, a small section of northern Georgia, and parts of North Carolina (in the high mountains), and southwestern Virginia. It appears that the Walden Gorge of the Tennessee River, below Chattanooga, forms some kind of a barrier to Nayad distribution, at least for certain species; at any rate, it forms a natural division within the Tennessee system. Of course, not all parts of this drainage have been investigated by myself; but collections have been made in all of the more important streams; and, together with the records obtained from other sources, it is believed that this fauna is now rather completely known.

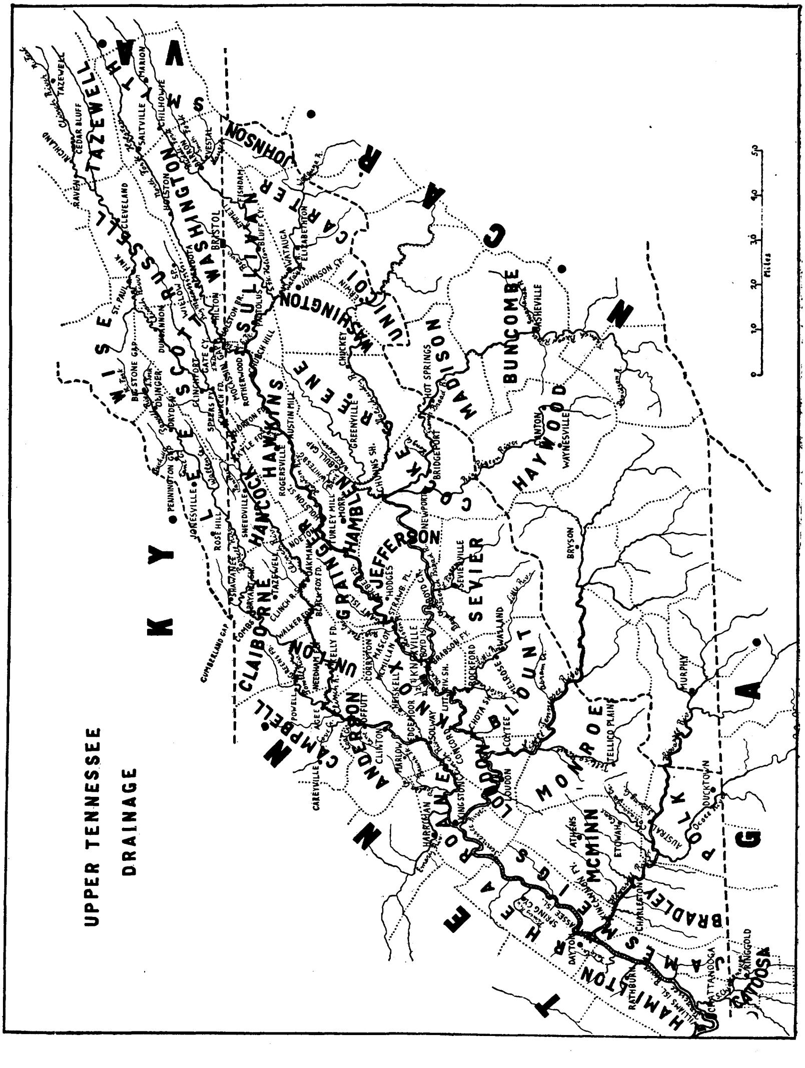
The region in question is known as one of the chief centers of Nayad development, and may be called the most prolific section of the world in this particular group. Many of the species described by the older authors (Conrad, Lea, and others) originally came from this region. But no synopsis of the whole fauna has been published, except the attempt made by Lewis (1871 and 1872).

In this connection it should be noted that Lewis's "Holston River" actually is the Tennessee River below Knoxville (chiefly in the region of Concord). Indeed, even at present, the natives in Concord call the river there "Holston"; but the maps of the U. S. Geological Survey give the name Tennessee to the river below the junction of the Holston (proper) and French Broad. In Knoxville the river is called Tennessee.

Aside from Lewis's paper, only a few are at hand which contribute to the fauna of this region. One of them has been published by Pilsbry and Rhoads (1896). This is, however, by no means a synopsis, containing hardly half of the forms which are found here. But on account of the good locality-records it is very valuable; in fact, it is, up to the present time, the most accurate publication in this respect. And further, two preliminary papers have been published, based upon my own collections; one by myself (Ortmann, 1913*b*), the other by Goodrich (1913). These, however, treat only of the headwaters-region of Powell, Clinch, and Holston in Virginia.

In addition to the material collected by myself, I have examined the upper Tennessee shells in the collection of Mr. B. Walker in Detroit, and I want to express to Mr. Walker my best thanks for the privilege of examining his shells, and the delightful days I spent in his home in April, 1916. Mr. Walker has a great number of shells from this region obtained from older collections, which in part are cotypes, topotypes, or other authentic material. But the greatest treasure in his collection are the Nayades collected by Professor Dr. C. C. Adams in 1899 to 1901, in the course of his work on *Io*, because Professor Adams always was very careful in recording his localities.

A large number of the "species" described by Lea (generally from very insufficient material), and of those listed by Lewis, are synonyms. Additional species have been subsequently described by various authors; but also these are mostly synonyms. There is a rule, observed in many cases, and indicated first by Wilson & Clark, '14, that one and the same shell assumes different shapes in the large rivers and in small streams and headwaters, a rule the existence of which will be shown elsewhere; and it is easily understood why the various local races have been regarded as good species, as long as


UPPER TENNESSEE
DRAINAGE
K Y.
V A.
N. C.
G A.
TENN.
TAZEWELL
RUSSELL
WISE
SCOTT
LEE
WASHINGTON
SMYTH
JOHNSON
CARTER
SULLIVAN
UNICOI
WASHINGTON
GREENE
HAWKINS
HANCOCK
CLAIBORNE
GRAINGER
HAMBLEN
JEFFERSON
COCKE
MADISON
BUNCOMBE
HAYWOOD
SEVIER
KNOX
UNION
CAMPBELL
ANDERSON
ROANE
LOUDON
BLOUNT
MONROE
McMINN
MEIGS
RHEA
BRADLEY
POLK
JAMES
HAMILTON
CATOOSA
RICHLAND
CEDAR BLUFF
RAVEN
CLEVELAND
ST. PAUL
BIG STONE GAP
JONESVILLE
PENNINGTON GAP
CUMBERLAND GAP
BRISTOL
JOHNSON CY.
ELIZABETHTON
GREENVILLE
ROGERSVILLE
MORRISTOWN
NEWPORT
HOT SPRINGS
ASHEVILLE
CANTON
WAYNESVILLE
BRYSON
KNOXVILLE
CLINTON
KINGSTON
LOUDON
HARRIMAN
DAYTON
ATHENS
ETOWAH
TELLICO PLAINS
MURPHY
DUCKTOWN
CHARLESTON
CHATTANOOGA
RINGGOLD
0 10 20 30 40 50
Miles

the intergrades were not known. But the discovery of the latter—and this was one of the problems to which I directed my attention—has necessitated the cancellation of a great number of these nominal species. Nevertheless, the fauna still remains remarkably rich, which surely in a large part is due to the comparatively old age of this river system, to the diversity of its character, and also to certain changes of the drainage which have taken place in the geological past.

In the following pages, the correct names of the various forms are given, conforming to the systematic arrangement published by the writer (Ortmann, 1910, 1912*b*), and conforming with the rules of priority. It should be remarked, that of practically all Tennessee-forms the anatomy has been investigated, but has not yet been published of all of them: the description of the rest will appear in due time. The two great papers of Simpson (1900 and 1914) are taken as a basis, and the quotations are from the last paper, so that it can be easily seen, where changes in nomenclature have been introduced. Also the names used by Lewis, those used by Pilsbry and Rhoads, by myself and Goodrich are given, in order to facilitate comparison with our list. The synonyms are all quoted unless they have been recognized and accepted as such by Simpson; but other references have been largely omitted, for the reason that they generally are found in Simpson's paper.

No full descriptions of the forms are given, but frequently the chief characters are briefly indicated.

The extralimital distribution has not been given in detail. Here and there it has been referred to, but only in especially interesting cases. In this respect, much work remains to be done, and in many North American Nayades the exact boundaries of the distribution have not yet been exactly located.

The material, upon which the present paper is founded, has been deposited in the Carnegie Museum of Pittsburgh, and comes chiefly from the collections made by myself; a very small part has come from other sources. The Carnegie Museum is in possession of the old collections of Hartman, Holland, and Juny, and a more recent collection has been bought from H. H. Smith. In addition, the museum is indebted to Messrs. Frierson and Walker for occasional exchanges of rare forms. As has been mentioned above, also Walker's collection has been examined, and incidentally some of the material of the U. S. National Museum, in Washington, chiefly some of Lea's types, has been studied.

It is believed that the Carnegie Museum possesses now the best collection representing the Upper Tennessee fauna, and with regard to the illustration of the distribution of the various forms, it has no equal, not to speak of the fine collection of soft parts. In view of the gradual, slow but steady, deterioration of the fauna in consequence of stream-pollution, there is great danger that the fauna will largely become destroyed, and that it will be impossible, in the future, to duplicate this collection. At the present time, conditions are fair, in some parts splendid; but there are already polluted streams, in which the fauna is gone. Such are: the Powell River, for a certain distance below Big Stone Gap, Va. (wood extracting plant); the North Fork Holston for a distance below Saltville, Va. (salt and plaster of Paris industries); French Broad River at Asheville, N. Car. (pollution comes—as I have been informed—from Davidson River, farther up); Big Pigeon River, from Canton, N. Car., all the way down (woodpulp and paper mill); Tellico River below Tellico Plains, Tenn. (old wood pulp and extracting mill). The building of dams (for water power, etc., for instance in Nolichucky River near Greenville, Tenn.) also has a deteriorating effect upon mussel life, and all this surely will increase in the future.

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Family: *MARGARITANIDÆ* Ortmann (1911*a,* p. 129).

Genus: CUMBERLANDIA Ortmann (1912*a,* p. 13).

1. CUMBERLANDIA MONODONTA (Say), 1829.

Unio monodonta Say, '29.—*Unio monodontus* Lewis, '71.—*Margaritana monodonta* Ortmann, '12*b,* p. 233 (anatomy).—*Margaritana monodonta* Simpson, '14, p. 521.

Widely distributed in the larger and medium rivers: Tennessee, Clinch, and Holston. According to Walker ('11), it goes up, in the Clinch, to Union Co., Tenn., but I found it also at Clinch River Station, Claiborne Co. In the Holston, I have traced it up to Austin Mill, Hawkins Co., Tenn. Walker gives it also from Little River, but this can be only in the lower part of it.

This is generally regarded as a rare species; but in the lower Clinch, in Anderson Co., and in the lower Holston, in Knox Co., Tenn., it is locally abundant.

Type locality: Falls of the Ohio.

Family: *UNIONIDÆ* Ortmann (1911*a,* p. 129).

Subfamily: UNIONINÆ Ortmann (1910, p. 116).

Genus: FUSCONAIA Simpson (1900).

Ortmann (1912*b,* p. 240).

2. FUSCONAIA PILARIS (Lea), 1840.

Unio pilaris Lea, '40.—*Unio globatus* Lea, '71.—*Unio ebenus* and *pilaris* Lewis, '71 and '72.—*Unio pilaris* Pilsbry & Rhoads, '96.—*Quadrula andrewsi* Marsh, '02.—*Quadrula beauchampi* Marsh, '02.—*Quadrula pilaris, andrewsi, beauchampi, globata* Simpson, '14, pp. 893–899.

This is the upper Tennessee representative of *F. subrotunda* Lea of the Ohio drainage, and it may be merely a dwarfed, globular form of the latter. I have seen the normal *subrotunda* from the Tennessee in northern Alabama, but I cannot tell whether the two pass into each other.

The typical form of *F. pilaris* passes into the following local races in an upstream direction, and it is hard to draw a line between them. In order to preserve the oldest names given, I have arbitrarily concluded to call by this name those more swollen forms where the transverse diameter of the shell is 55 per cent. of the length and over.

This typical *F. pilaris* is restricted to the large rivers: Tennessee, lower part of Little Tennessee, lower French Broad, lower Holston and lower Clinch. In the two latter rivers it is rare, and intergrades with the next form, going up, in the Holston, to Grainger Co., and, in the Clinch, to Anderson Co., Tenn.

Type locality: French Broad River, Tenn., and Holston River, Tenn. (topotypes examined).

3. FUSCONAIA PILARIS LESUEURIANA (Lea), 1840.

Unio lesueurianus Lea, '40.—*Quadrula flexuosa* Simpson, '00.—*Quadrula flexuosa* Simpson, '14, p. 887.

According to Simpson, '14, p. 894, *lesueuriana* is synonym to *pilaris.*

Like *pilaris,* but less swollen; the diameter of the shell is from 45 per cent. to 54 per cent. of the length.

Of *Q. flexuosa,* I have seen, in the Walker collection, two specimens from Holston River, Knoxville (Mrs. Andrews), and one specimen from Holston River, Hamblen Co. (opposite Grainger Co.) (Marsh). They had been compared with the type of *flexuosa,* and thus labeled by Marsh. Two of these, with the diameter of 53 and 54 per cent., are *lesueuriana,* while one (Knoxville), with diameter of 56 per cent., is *pilaris.* Simpson's measurements of *flexuosa* give the diameter of 51 per cent., and thus it should be made a synonym of *lesueuriana.*

This is the form of the medium rivers; it turns up in single individuals in the region of Knoxville, and becomes the prevailing form in the lower Clinch and in the whole Holston proper. In the Clinch, it has been traced up, in single individuals, to Scott Co., Va., and it also goes into the lower Powell, up to Claiborne Co., Tenn. From the Holston, it goes in the lower parts of the North and South Fork: but at and near its upper limit, it always intergrades with the next form (*bursa-pastoris*).

Type locality: Caney Fork River, Tenn. (and Holston River, Tenn.). (Thus it seems to exist also in the Cumberland drainage, but this requires further investigation. Wilson and Clark, '14, do not mention it.)

4. FUSCONAIA PILARIS BURSA-PASTORIS (Wright), 1896.

Unio bursa-pastoris Wright, '96.—*Unio kirtlandianus* Pilsbry & Rhoads, '96.—*Fusconaia bursa-pastoris* Ortmann, '13*a,* p. 90 (anatomy), and '13*b,* p. 311.—*Fusconaia bursa-pastoris* Goodrich, '13, p. 93.—*Quadrula bursa-pastoris* Simpson, '14, p. 890.

This is the compressed headwaters-form of *F. pilaris,* connected with it through the intermediate form *lesueuriana.* It has the same relation to *F. pilaris,* as has *F. kirtlandiana* (Lea) of the upper Ohio drainage to *F. subrotunda*; it is practically the same thing, except that it does not reach the size of it, and does not develop the "wing" seen on the posterior upper margin of *kirtlandiana.* It is perfectly clear that the form mentioned by Pilsbry & Rhoads from Watauga River, Johnson City, Tenn., is this, and, indeed, I have found it very close to this locality.

The diameter of this form is less than 45 per cent. of the length, and it appears as if the lack in this direction is compensated by a greater circumference of the shell, *bursa-pastoris* often reaching a size (length and height) not seen in either *pilaris* or *lesueuriana.*

The metropolis of this form is in Clinch River; a few specimens have been found in the lower Clinch, in Knox and Anderson Cos. (associated with *lesueuriana* and even *pilaris*); farther up, from Claiborne Co., Tenn., into Virginia, it becomes more and more abundant, and north of the state line, where *lesueuriana* disappears (only found at Clinchport), it is developed as a pure race, going up into the headwaters as far as Cedar Bluff, Tazewell Co., Va. In Powell River, similar conditions prevail; in the lower Powell it is found associated and intergrading with *lesueuriana,* but north of the state line, in Virginia, it is exclusively present, going up to Big Stone Gap, entering even a small tributary (Cane Creek, Lee Co., Va.).

In the Holston, this form is not so well developed, and not so abundant, but is present nevertheless, and also has the same relation to *lesueuriana,* first being associated with it, but then being exclusively present. The latter is the case in North Fork Holston, in Washington Co., Va. In South Fork Holston, it goes up to Bluff City, Sullivan Co., Tenn., but accompanied by *lesueuriana*; but it enters here Wautauga River, where it is found alone. In the Holston proper, in a downstream direction, it is quite rare, but it has been found as far down as Grainger Co., so that in this region (as is the case in lower Clinch) occasionally all three forms of the species may be obtained together.

Type locality: Powell River, Va. (topotypes examined).

Note: The color of the soft parts and eggs in the *pilaris* group varies greatly. The soft parts may be of the orange type, and the eggs (and placentæ) may be red: this is chiefly the case in Powell and upper Clinch rivers. Elsewhere, in Holston, French Broad, and Tennessee, pale soft parts, with whitish eggs prevail.

5. FUSCONAIA CUNEOLUS (Lea), 1840.

Unio cuneolus Lea, '40.—*Unio cuneatus* Reeve, Conch. Icon. 16. Unio, '64, pl. 16, f. 73.—*Unio cuneolus* Lewis, '71.—*Unio cuneolus* Pilsbry & Rhoads, '96.—*Pleurobema cuneolus* Simpson, '14, p. 743.

This is not a *Pleurobema,* but a *Fusconaia,* taking the place of the group of *F. flava* (Raf.) (=*rubiginosa* Lea) in the upper Tennessee region. It is a very good species.

The original and typical *cuneolus* represents a compressed headwaters-form, which, farther down, changes into a more swollen form. I have, arbitrarily, decided to call specimens with the diameter less than 50 per cent. of the length by this name.

This form is found in Powell, Clinch, and Holston rivers, in the upper parts. In the Powell, from Union Co., Tenn., up to Olinger, Lee Co., Va. (also in Puckell Creek, Lee Co.); in the Clinch from Anderson Co., Tenn., up to Clinchport, Scott Co., Va.; in the Holston from Grainger Co., Tenn., up the North Fork at Mendota, Washington Co., Va., and Big Moccasin Creek, Scott Co., Va. It has not been found in South Fork Holston, Watauga, or any of the eastern tributaries of the Tennessee, although the var. *appressa* goes to the lower Nolichucky and into the Little River drainage.

In addition, it is in some of the tributaries of the lower Clinch: in Poplar Creek, Roane Co. (intergrading here with *cuneolus appressa*) and in Emory River, at Harriman, Roane Co., Tenn.

Type locality: Holston River, Tenn. (topotypes examined).

6. FUSCONAIA CUNEOLUS APPRESSA (Lea), 1871.

Unio appressus Lea, '71.—*Unio tuscumbiensis* Lea, '71.—*Unio flavidus* Lea, '71.—*Pleurobema tuscumbiensis* Simpson, '14, p. 748.

There has been great confusion about this form, for the reason that the type-set in the U. S. Mus. (examined by myself) contains three specimens, of which only one, the figured type, is this, while the other two belong to *Lexingtonia dolabelloides conradi* (Van.). But several authors seem to have taken the latter as the types, and thus, for instance, *Pleurobema appressum* Simpson ('14, p. 747) is not this, but *Lexingtonia dolabelloides conradi.*

The figured type of Lea is a more swollen form of *F. cuneolus,* and resembles the latter in every respect except obesity. I have drawn the line between the two at the diameter of 50 per cent. of the length, and specimens with this diameter, and over, I call *F. cuneolus appressa.*

This variety belongs to the larger rivers. I have not seen it from the Powell, and in the Clinch it turns up for the first time below the mouth of the Powell, at Offutt, Anderson Co., Tenn., but it goes into a smaller tributary of the lower Clinch, Poplar Creek, Roane Co., associated here with typical *cuneolus.* In Emory River, only *cuneolus* has been found. In the Holston, *appressa* turns up first at Austin Mill, Hawkins Co., Tenn., associated and intergrading with typical *cuneolus.* I also found *F. cuneolus appressa* in the Nolichucky, at its mouth, and then it seems to be the prevailing form in the Tennessee at and below Knoxville.

Remarkably enough, I have found a single specimen of this form in a very small creek tributary to Little River—Pistol Creek, Rockford, Blount Co., Tenn.—it has the diameter of 50 per cent., and thus stands just on the line dividing the two varieties. This specimen is rather stunted in growth, and may be only an individual abnormality.

Type locality: Tuscumbia, Ala. (Tennessee River and Holston River, Tenn.) (type examined).

Note: This type of shell is also present in the Tennessee drainage in North Alabama, where again the *appressa*-form inhabits the larger rivers, while in the smaller streams typical *cuneolus* is found.

7. Fusconaia cor (Conrad), 1834.

Unio cor Conrad, '34.—*Unio edgarianus* Lea, '40.—*Unio obuncus* Lea, '71.—*Unio edgarianus* Lewis, '71.—*Unio andersonensis* Lea, '72.—*Unio edgarianus* Pilsbry & Rhoads, '96.—*Pleurobema edgarianum* Simpson, '14, p. 741.

According to Frierson (Naut., 29, '16, p. 102 ff.) the type of *U. cor* Conrad is the same as shells which have been called *edgarianus, tuscumbiensis, andersonensis*. Frierson has sent for inspection a specimen, which had been compared with the type of *cor,* and this proved to be *edgarianus*. This is also supported by Conrad's description, which says that *cor* has rays, some of them broad.

This species is closely allied in shell and anatomy to *F. cuneolus,* but is distinguished by very smooth and shining epidermis, and by beautiful color: upon a brownish or yellowish background are bold, dark green to blackish rays, while *cuneolus* has greenish or yellowish-olive epidermis, with finer, greenish rays.

The original *cor* is a much swollen form, and belongs to the larger rivers; but in the smaller streams, it again passes into a more compressed form (*F. cor analoga*). I have drawn the line between the two at the diameter of 50 per cent. of the length, so that specimens with this or a greater diameter fall under *cor*.

I have found this form only in Clinch River, at Edgemoor, Anderson Co., Tenn., and, according to Pilsbry & Rhoads, it is in the Clinch in Roane Co. In the Walker collection, there are specimens belonging here from Needham Ford, Union Co., Tenn. (associated with var. *analoga*). In the same collection are typical *cor* also from Poplar Creek, Roane Co., a rather small stream, where we should expect the headwaters-form. (It happens, sometimes, that a small tributary of a large river has, at or near its mouth, the large-river form.) Lewis reports this form from the Tennessee below Knoxville.

Type locality: Elk River, Ala. (and Flint River, Ala.) (topotypes examined, loaned by Frierson).

Note: Conrad's Flint River is not the one in Madison Co., but the one in Morgan Co., Ala.

8. FUSCONAIA COR ANALOGA nov. var.

Unio edgarianus Reeve, Conch. Icon. 16. Unio. 1864, pl. 15, f. 65.—*Fusconaia appressa* or *edgariana* Goodrich, '13, p. 93.

This flat form of *cor* (or *edgarianus*) has never been separated from the swollen typical form, probably because there never was any doubt about its affinity, on account of the peculiar color character of the shell. However, it differs from typical *cor* as strongly as does *F. cuneolus* from *F. cuneolus appressa,* and thus deserves a varietal name. The shell figured by Reeve as *U. edgarianus* surely is this, since the compressed shape is mentioned. Specimens with the diameter less than 50 per cent. of the length fall under this variety.

This is the form of the headwaters and small streams. It is in the Powell, and goes up to Lee Co., Va. It is in the Clinch, from Needhams Ford, Union Co., Tenn. (Walker coll.) up to Cleveland, Russell Co., Va., and becomes quite abundant in the Virginian part of this river. In addition, it is in the North Fork Holston from Hawkins Co., Tenn., up to Holston, Washington Co., Va.

It has never been found in any other part of the Holston drainage, or any other river or creek in East Tennessee, and its restriction to North Fork Holston, Clinch, and Powell, and its continuation downward, as typical *cor,* in the Tennessee proper alone, is quite remarkable.

Type locality: Clinch River, Speers Ferry, Scott Co., Va. (types in Carn. Mus. Cat. no. 61.6326).

Note: The group of *F. cor* is also represented in the Tennessee drainage of North Alabama, and, also here, *cor* is in the Tennessee proper and the lower parts of the larger tributaries (Elk, both Flint, and Paint Rock Rivers), while in the upper parts, at least of Paint Rock River, it passes into the *analoga*-form.

GROUP OF FUSCONAIA BARNESIANA (Lea).

Forms of this group have been listed by Lewis ('71) as *U. barnesianus, pudicus,* and *tumescens.* In Simpson's papers ('00 and '14), they stand under *Pleurobema,* and their proper position and mutual relation have not at all been understood.

All these shells belong to *Fusconaia,* but form a separate group within this genus, distinguished from the other species by very shallow beak cavities, and the peculiar color of the eggs and placentæ, which is darker or lighter purplish-black, or some similar shade (see Ortmann, '17).

Also here we have the phenomenon that flat and compressed forms are found in the headwaters, swollen forms in the larger rivers, with the intergrades between them in the rivers of medium size. The transition is complete and very gradual, so that it is extremely difficult to draw separating lines. The division into three local (or rather ecological) races, introduced here, is entirely arbitrary, but justified to a degree by the old division into "species," and the fact that it is just such an intergrade which has first received a name (*barnesianus*). The difficulty of classifying these forms becomes greater yet, because these shells vary not only in obesity, but also in general outline, development of beaks, and color markings.

I shall distinguish three forms: *barnesiana bigbyensis,* with the diameter less than 40 per cent. of the length; *barnesiana,* with the diameter from 40 to 49 per cent.; and *barnesiana tumescens,* with the diameter of 50 per cent. and over.

9. FUSCONAIA BARNESIANA (Lea), 1838.

Unio barnesianus Lea, '38.—*Unio meredithi* Lea, '58.—*Unio pudicus* Lea, '60.—*Unio lyoni* Lea, '65.—*Unio barnesianus* and *pudicus* Lewis, '71.—*Unio tellicoensis* Lea, '72.—*Unio lenticularis* Lea, '72.—*Pleurobema barnesianum, pudicum, lenticulare, meredithi*

Simpson, '14, pp. 754, 755, 790, 791.—*Fusconaia barnesiana* Ortmann, '17, p. 59.

Simpson, '14, p. 754, makes *tellicoense* a synonym of *barnesianum,* and (p. 755) *lyoni* a synonym of *pudicum.*

U. pudicus is practically the same as *barnesianus,* but with distinct rays; *meredithi* is a *pudicus* with only few rays; *U. lyoni* is large and has rays; it also has somewhat elevated beaks, inclining thus toward the var. *tumescens; tellicoensis* and *lenticularis* are moderately large, with indistinct rays, practically identical with *barnesianus.*

This form, which we must regard as the typical species, unfortunately represents the intermediate condition between the flat and swollen extremes. It is represented by shells from the Powell, Clinch, and Holston, going up here well toward the headwaters: in Powell to Big Stone Gap, Wise Co., Va.; in the Clinch to Richland, Tazewell Co., Va.; in the Holston to the North Fork at Holston, Washington Co., Va., and to the South Fork at Bluff City, Sullivan Co., Tenn. In the downstream direction, it can be traced to the Tennessee River below Knoxville. However, it is most abundant in lower Powell, in the middle Clinch, and in the Holston near the Forks. In addition, it turns up in many tributaries: Cove Creek, Campbell Co., Tenn.; Coal Creek, Anderson Co., Tenn.; Big Flat Creek, Knox Co.; in Little Pigeon River, Boyd Creek, Pistol Creek, Tellico River, Cane Creek (McMinn Co.), Hiwassee River, etc.

It is a common form, of rather universal distribution under the proper conditions. Toward the headwaters, it passes generally into the var. *bigbyensis,* but there are some small creeks where this is not the case (at any rate, where the *bigbensis*-form has not been found). In the larger rivers it gradually passes into the form *tumescens,* and is often found associated with it.

Type locality: Cumberland River, Tenn. (not found by Wilson and Clark, '14, although they mention *"Fleurobema crudum"* =*barnesiana tumescens*; the latter, however, surely has been misidentified).

10. FUSCONAIA BARNESIANA BIGBYENSIS (Lea), 1841.

Unio bigbyensis Lea, '41.—*Unio estabrookianus* Lea, '45.—*Unio fassinans* Lea, '68.—*Unio fascinans* Pilsbry & Rhoads, '96.—*Pleurobema fassinans rhomboidea* Simpson, '00.—*Fusconaia estabrookiana* Goodrich, '13, p. 93.—*Pleurobema bigbyense, P. fassinans* and var. *rhomboideum, P. estabrookianum* Simpson, '14, pp. 756, 797, 798, 803.—*Fusconaia barnesiana bigbyensis* Ortmann, '17, p. 59.

This is the form of the headwaters and small tributaries of the Tennessee system, with a diameter of less than 40 per cent. of the length of the shell. *U. bigbyensis* and *P. fassinans rhomboideum* represent normal specimens, the former with distinct, the latter with indistinct or missing rays. *U. estabrookianus* is founded upon very large, somewhat distorted specimens; and the only type (examined in Washington) of *U. fassinans* is an exceptionally elongated, rather large specimen without rays.

Also in this form we have the phenomenon that the compressed headwaters shell, so to speak, gains in circumference what it has lost in diameter. The var. *bigbyensis* grows much larger than the forms farther downstream. It is very variable in size, shape, color, and sometimes it is hard to distinguish it from *Pleurobema oviforme argenteum*. Generally, darker (brownish) color of epidermis, with fine rays (when present), forming no blotches, and a more central position of the beaks distinguish *F. barnesiana bigbyensis*. Of course, the anatomy is entirely different.

This race is very generally distributed over the whole upper Tennessee drainage, but disappears in the larger rivers. It often is in very small streams of the headwaters (North Fork Powell, and other small streams in the Powell drainage; in the Clinch at Tazewell, Va.; Big Moccasin Creek, all three forks of the Holston, and also Laurel Creek, Watauga River, and Little Pigeon River; Second Creek at Knoxville; Sale Creek in Rhea Co.; Little River; Abram Creek in Blount Co.; Tellico River; Spring Creek, Polk Co., and Cane Creek, McMinn Co.).

As has been stated, even at the uppermost localities, in very small creeks, *F. barnesiana* in its typical form may be present, and may be associated with *bigbyensis*. Farther down, *barnesiana* soon begins to prevail. The form *bigbyensis* has been traced down in the Powell to Combs, Claiborne Co., Tenn.; in the Clinch to Clinchport, Scott Co., Va.; but a single specimen has been found at Solway, Knox Co., Tenn., apparently an exceptional case; in the Holston it has not been found below the point where the North and South Fork unite.

Type locality: Big Bigby Creek, Maury Co., Tenn. (trib. to Duck River and lower Tennessee).

11. FUSCONAIA BARNESIANA TUMESCENS (Lea), 1845.

Unio tumescens Lea, '45.—*Unio crudus* Lea, '71.—*Unio radiosus* Lea, '71.—*Unio tumescens* Lewis, '72.—*Unio tumescens* Pilsbry & Rhoads, '96.—*Pleurobema tumescens* and *P. crudum* Simpson, '14, p. 751, 753.—*Fusconaia barnesiana tumescens* Ortmann, '17, p. 59.

(Simpson makes *radiosus* a synonym of *tumescens.*)

This is the swollen form of the large rivers, with a diameter of 50 per cent. of the length, and over. It also generally has higher beaks, making the outline of the shell more nearly triangular; but higher beaks are also sometimes observed in the typical *F. barnesiana* (*lyoni*-type). *U. tumescens* represents the extreme in obesity, and *radiosus* (type examined!) is very close to it. *U. crudus* is the much eroded form of the French Broad River (topotypes at hand). The two former have more or less developed rays, the latter is rayless.

F. barnesiana tumescens has its metropolis in the Tennessee River at and below Knoxville. But it is also found some distance in the rivers above this point. From the Clinch it is known from the lower part; the uppermost locality is at Edgemoor, Anderson Co. It also has been reported (by Pilsbry and Rhoads) from Emory River at Harriman, Roane Co. In the Holston proper I have observed it as far up as Noeton, Grainger Co. It is also in the lower French Broad, at Boyd Creek, Sevier Co., in the Little Tennessee in Monroe Co., and in Hiwassee River, at Austral, Polk Co. (intergrading, at these places, with typical *F. barnesiana*).

Remarkably enough, a small tributary of Little River, Pistol Creek, Rockford, Blount Co., Tenn., contains shells, most of which, according to actual measurements, should be classed with *tumescens*. But these shells are more or less distorted and stunted, and apparently abnormal; those of more normal growth correspond in their measurements to *barnesiana*.

Type locality: "Alexandria, La." This is surely incorrect. Specimens from the Tennessee River in northern Alabama have been recognized as this form by Call, Pilsbry and Rhoads, and Walker; and Lewis ('72), and Pilsbry and Rhoads quote it from East Tennessee, and I think this identification is quite correct.

Note: In northern Alabama, in the Tennessee drainage, and generally below the Walden Gorge, this type of shell is also abundant, and again here we have the *tumescens*-form in the Tennessee proper and the lower parts of some of the tributaries (Sequatchie River, Shoals Creek). Farther up in the tributaries, typical *barnesiana* prevails, and the *bigbyensis*-form is in the smallest streams. Forms belonging to the latter, corresponding closely to *fassinans rhomboideum*, and the large *estabrookianus*-type of the upper Powell, Clinch and Holston, have come to hand from the headwaters of Paint Rock River and Elk River (Estill Springs). In Shoals Creek, Lauderdale Co., Ala., a very peculiar mixture is found, containing all three types side by side, intergrading completely, but with the typical *barnesiana* prevailing.

Genus: AMBLEMA Rafinesque, 1820.

Crenodonta (Schlueter, '36), Ortmann, 1912*b*, p. 245.—*Amblema* Frierson, 1914*a*, p. 7.

12. AMBLEMA PLICATA COSTATA (Rafinesque), 1820.

Amblema costata Rafinesque, '20.—*Unio undulatus* Lewis, '71.—*Unio undulatus* Pilsbry & Rhoads, '96.—*Crenodonta undulata* Ortmann, '12*b*, p. 246 (anatomy).—*Crenodonta undulata* Goodrich, '13, p. 93.—*Quadrula undulata* Simpson, '14, p. 819.—*Amblema costata* Frierson, '14*a*, p. 7.—*Quadrula costata* Vanatta, '15, p. 556.—*Amblema* (*plicata*) *costata*, Utterback, '16, p. 39.

As to nomenclature, see Frierson and Vanatta (*l. c.*). The identity of Rafinesque's species has been recognized already by Conrad in

1834 and 1836, and the name of *costata* has been used by Kuester and Reeve. Moreover, the true *U. undulatus* Barnes, '23, is actually *U. heros* Say, '29. *U. plicatus* Say, 1817, is the Lake Erie form (=*hippopæus* Lea, '45), and *costata* Raf. of the Ohio drainage, apparently is the ancestral form to this. But according to the laws of priority, *plicatus,* although being a local race, has to stand as the main species.

Generally distributed in the upper Tennessee drainage, in Powell, Clinch, lower Emory, Holston, French Broad, Nolichucky rivers, lower Little River, and Tennessee proper. Goes up to Shawanee, Claiborne Co., Tenn., in the Powell; to Cleveland, Russell Co., Va., in the Clinch; to Hilton, Scott Co., Va., in North Fork Holston; and Pactolus, Sullivan Co., Tenn., in South Fork Holston; to the mouth of the Nolichucky at Chunn's Shoals, Hamblen Co., Tenn. It also occasionally enters some rather small streams, for instance: Poplar Creek, Roane Co., and Boyd Creek, at Boyd Creek, Sevier Co., Tenn.

Type locality: Ohio River (Raf.) (according to Vanatta, the type is from small creeks in Kentucky).

Genus: QUADRULA Rafinesque, 1820.

Ortmann, 1912*b,* p. 250.

13. QUADRULA PUSTULOSA (Lea), 1831.

Obliquaria bullata Refinesque, '20.—*Unio pustulosus* Lea, '31.—*Unio pernodosus* and *U. pustulosus* Lewis, '71.—*Unio pustulosus* and *sphæricus* Pilsbry & Rhoads, '96.—*Quadrula pustulosa* Ortmann, '12*b,* p. 251 (anatomy).—*Quadrula pustulosa* Simpson, '14, p. 848.

According to Vanatta ('15, pp. 556, 557), *Obliquaria retusa* Raf., '20, "probably" is *U. pustulosus* Lea, '31, and *O. bullata* Raf., '20, is *U. pernodosus* Lea, '45: but the latter is not different from *pustulosus.* The identity of *O. bullata* and *U. pustulosus* has been asserted by Conrad in 1834, and is evident from Rafinesque's description. Also Kuester and Reeve have used the name of *bullatus.* However, as Vanatta points out, the specific name *bullata* is preoccupied by

Obliquaria flexuosa bullata Raf., '20 (Internat. Rules of Zoöl. Nomencl., Art. 11), and since the identity of *O. retusa* is not quite certain, the name given by Lea becomes available.

I cannot see anything but an individual variation in what Lea has called *U. pernodosus*. This is given from "North Carolina," according to Lea probably from the tributaries of the Tennessee (in the mountains). But its occurrence in these parts has never been confirmed. *U. sphæricus* (?), reported by Pilsbry & Rhoads from near Chattanooga, surely is this.

This species prefers the larger rivers, and is not rare in them, chiefly so in the Tennessee at and below Knoxville. I traced it up the Clinch to Offutt, Anderson Co., Tenn., but a single specimen is in the Walker collection also from the Powell, at Bryant Shoals, Claiborne Co., Tenn. In the Holston, it goes up to McBee Ford, near Hodges, Jefferson Co., and in the French Broad, it reaches the lower part of the Nolichucky at Chunn's Shoals, Hamblen Co., Tenn.

Type locality: Ohio.

14. QUADRULA VERRUCOSA (Rafinesque), 1820.

Obliquaria verrucosa Rafinesque, '20.—*Unio conjugans* Wright, Naut., 13, '99, p. 89.—*Quadrula tuberculata* Ortmann, '12*b*, p. 254 (anatomy).—*Tritogonia tuberculata* and *T. conjugans* Simpson, '14, pp. 318, 322.—*Tritogonia verrucosa* Vanatta, '15, p. 554. —*Quadrula verrucosa* Utterback, '16, p. 62.

This form has been previously reported, as *U. conjugans*, only from Hiwassee River, and the type (examined in Washington) is indeed a remarkable shell, an apparently stunted, shortened male of this species (individual abnormity). That this species is actually present in the lower part of the Hiwassee, in Meigs Co., Tenn., is shown by three fine specimens in the Walker collection (Adams). It is very remarkable that I did not find a trace of this striking species in any other part of the upper Tennessee drainage.

Type locality: Ohio River.

Note: Below the Walden Gorge, in Sequatchie River, Tenn., and the Tennessee drainage in northern Alabama, this species is more abundant, both in the Tennessee River and its tributaries (Paint

Rock River, Flint River in Madison Co., Elk River, Shoals Creek, Bear Creek).

15. QUADRULA METANERVA (Rafinesque), 1820.

Obliquaria metanerva Rafinesque, '20.—*Unio metanerva* Lewis, '71. —*Quadrula metanerva* Ortmann, '12*b*, p. 255 (anatomy).—*Quadrula metanerva* Simpson, '14, p. 834.

In the Tennessee at and below Knoxville. Above Knoxville, I found only a single specimen in the Holston, at Mascot, Knox Co. Rare.

Type locality: Kentucky River (according to Vanatta, '15, the types are from Ohio River).

16. QUADRULA INTERMEDIA (Conrad), 1836.

Unio intermedius Conrad, '36.—*Unio tuberosus* Lea, '40.—*Unio sparsus* Lea, '41.—*Unio intermedius, sparsus, tuberosus* Lewis, '71.—*Quadrula sparsa* Ortmann, '12*b* (anatomy).—*Quadrula intermedia* Goodrich, '13, p. 93.—*Quadrula tuberosa, tuberosa sparsa, intermedia* Simpson, '14, pp. 836, 837.

According to Simpson, *Q. tuberosa* is more swollen than *Q. intermedia,* and I have seen rather swollen specimens in the Walker collection from the Cumberland River and the Tennessee in North Alabama. However, the original figure of *U. tuberosus* Lea is not much swollen. My specimens from the upper Tennessee drainage are all more or less compressed. We might have here again a case where in larger rivers a more swollen form turns up. But even if this should be correct, we should only regard these forms as races of the same species.

Reported from Nolichucky, Holston, Clinch, and Tennessee rivers, and said to be abundant. According to the material collected and seen by myself, it is decidedly a rare species. I know it from the Holston at Church Hill, Hawkins Co., Tenn.; from the South Fork Holston at Pactolus and Bluff City, Sullivan Co., Tenn.; from North Fork Holston at Mendota, Washington Co., Va.; and from the Clinch River at Clinchport, Scott Co., Va. (Walker coll.), and Cleveland, Russell Co., Va.

It is remarkable that I did not find it in the lower parts of these rivers, although it has been reported from the Knoxville region, and from the Tennessee in northern Alabama.

Type locality: Nolichucky River, Tenn.

17. QUADRULA CYLINDRICA (Say), 1817.

Unio cylindricus Say, '17.—*Unio cylindricus* Lewis, '71.—*Unio cylindricus* Pilsbry & Rhoads, '96.—*Quadrula cylindrica* Ortmann, 12*b*, p. 256 (anatomy).—*Quadrula cylindrica* Simpson, '14, p. 832.

Reported from the Tennessee below Knoxville and from the Holston River. It is rather frequent in the larger rivers, and goes, in the Holston, up to Hawkins Co., Tenn. In the region of the forks it begins to incline toward the next form; however, in Big Mocassin Creek, Mocassin Gap, Scott Co., Va., a tributary of the North Fork, I found a rather normal *cylindrica.* In the Clinch, it goes to Clinchport, Scott Co., Va. It is also in the Powell, up to Claiborne Co., Tenn.

Type locality: Wabash River.

18. QUADRULA CYLINDRICA STRIGILLATA (Wright), 1898.

Unio cylindricus strigillatus Wright, Nautilus, 12, '98, p. 6.—*Quadrula cylindrica strigillata* Ortmann, '13*b*, p. 311.—*Quadrula cylindrica strigillata* Goodrich, '13, p. 93.

Simpson ('14, p. 834) does not admit this as a separate form; but it is a very good and well-marked local race, belonging to the headwaters, being compressed, devoid of large tubercles, but thickly covered with small ones.

Its metropolis is in the upper Clinch River. Intergrades between this and the main form are found in Scott Co., Va., and thence farther up, it becomes a pure race, and goes up to Cedar Bluff in Tazewell Co., Va. The same conditions prevail in Powell River, where it intergrades with the normal type in Claiborne Co., Tenn., and then goes up to Pennington Gap in Lee Co. It also exists in North Fork Holston, from Hawkins Co., Tenn., to Mendoto, Washington Co., Va., and in the South Fork Holston at Pactolus, Sullivan Co., Tenn.

But the specimens from the Holston drainage are not so well and typically developed as those from the upper Clinch.

Type locality: "Clinch River, Lee Co., Va." A case of inexcusable carelessness, for the Clinch never touches that county.

Genus: ROTUNDARIA Rafinesque (1820).

Ortmann, 1912*b,* p. 257.

19. ROTUNDARIA TUBERCULATA (Rafinesque), 1820.

Obliquaria tuberculata Rafiesque, '20.—*Unio verrucosus* Lewis, '71.—*Unio verrucosus* Pilsbry & Rhoads, '96.—*Rotundaria tuberculata* Ortmann, '12*b,* p. 258 (anatomy).—*Quadrula* (*Rotundaria*) *tuberculata* Simpson, '14, p. 903.

Abundant in the larger rivers, going rather far up toward the headwaters. The extreme points are: Clinch River, Clinchport, Scott Co., Va.; North Fork Holston River, Mendota, Washington Co., Va.; South Fork Holston River, Pactolus, Sullivan Co., Tenn.; Nolichucky River, Chunn's Shoals, Hamblen Co., Tenn. I have it also from Boyd Creek at Boyd Creek, Sevier Co., Tenn., a very small tributary of French Broad.

In the other eastern tributaries of the Tennessee (Little River, Little Tennessee, and Hiwassee) it has not been found, and also no records are at hand from Powell River.

Type locality: Ohio River.

Genus: PLETHOBASUS Simpson (1900).

Ortmann, 1912*b,* p. 259.

20. PLETHOBASUS COOPERIANUS (Lea), 1834.

Unio cooperianus Lea, '34.—*Unio cooperianus* Lewis, '71.—*Unio cooperianus* Pilsbry & Rhoads, '96.—*Plethobasus cooperianus* Ortmann, '12*b,* p. 261 (anatomy).—*Quadrula cooperiana* Simpson, '14, p. 852.

In the Tennessee River at and below Knoxville, down to Chattanooga (Pilsbry & Rhoads). Also in the lower Clinch River; I have it from Edgemoor, Anderson Co., Tenn., and Pilsbry and Roads give it from Patton's Ferry, Roane Co., Tenn. I also have found it in French Broad River, at Boyd Creek, Sevier Co., Tenn. Records from "Holston River" probably refer to the Tennessee, at any rate, it must be a rare shell above Knoxville.

Type locality: Ohio River.

21. PLETHOBASUS CYPHYUS (Rafinesque), 1820.

Obliquaria cyphya Rafinesque, '20.—*Unio æsopus* Lewis, '71.—*Plethobasus æsopus* Ortmann, '12*b*, p. 260 (anatomy).—*Pleurobema æsopus Simpson,* '14, p. 806.—*Pleurobema cyphia* Vanatta, '15, p. 556

In the larger rivers, Tennessee, Clinch, Powell, Holston, and French Broad, going up, in the Powell, to Bryant Shoals, Claiborne Co., Tenn.; in the Clinch to Clinchport, Scott Co., Va.; in the Holston to the mouth of the North Fork at Rotherwood, Hawkins Co., Tenn.

Type locality: Falls of the Ohio.

22. PLETHOBASUS CYPHYUS COMPERTUS (Frierson), 1911.

Unio varicosus Lewis, '71.—*Unio compertus* Frierson, '11, p. 53, pl. 3 (middle and lower figures).—*Pleurobema compertum* Simpson, '14, p. 809.

Specimens in the Walker collection from "Holston River, Knoxville," are authentically labeled *varicosus* Lewis, and *compertus* Frierson, and they agree very well with specimens collected by myself in French Broad River, at Boyd Creek, Sevier Co., Tenn. My specimens (I have five) are larger than Frierson's figures, and most of them are more drawn out posteriorly. They were found associated with one specimen of the true *P. cyphyus,* and resemble the latter very much, except that the radial row of knobs on the disk is poorly developed, almost obliterated, and that the soft parts are not of orange, but of pale color. (For the rest, the anatomy of male and female is like that of *P. cyphyus.*)

I consider this as a variety of *P. cyphyus,* since in some of my specimens, the row of knobs is more distinct, and since typical *cyphyus* often has these knobs nearly obliterated. Whether the soft parts are always pale remains to be seen (the specimen of typical *cyphyus* from the same locality had orange soft parts): but several other shells have, in the French Broad, the tendency to develop pale soft parts, or pale nacre, while they are tinted elsewhere.

This seems to be a rare shell, which has been reported by Lewis from the Tennessee below Knoxville, by Frierson from the "Clinch and Holston"; Walker has specimens from "Holston, Knoxville" (probably Tennessee), and I found it in the lower French Broad. It might be that this is a local race, restricted in its distribution, and possibly with its center in the lower French Broad: but more material with exact localities should be secured.

Type locality: Clinch and Holston rivers.

Genus: LEXINGTONIA Ortmann (1914).

Ortmann, 1914, p. 28.

23. LEXINGTONIA DOLABELLOIDES (Lea), 1840.

Unio dolabelloides Lea, '40.—*Unio thorntoni* Lea, '57.—*Unio mooresianus* Lea, '57.—*Unio recurvatus* Lea, '71.—*Unio circumactus* Lea, '71.—*Unio subglobatus* Lea, '71.—*Unio dolabelloides* and *mooresianus* Lewis, '71.—*Pleurobema dolabelloides* Simpson, '14, p. 752.

U. thorntoni, mooresianus, recurvatus, circumactus, and *subglobatus* have been recognized by Simpson as synonyms of this.

Also here we have a case where a swollen form (*dolabelloides*) is found in the larger rivers, and a compressed one (*conradi*) in the smaller streams, with the intergrades existing between them. I have drawn the line between the two at the diameter of 50 per cent. of the length, so that forms with the diameter 50 per cent. or over are *dolabelloides,* and those below 50 per cent. are *conradi.*

L. dolabelloides in its typical development is a swollen form, generally also with more elevated beaks. It is known from the Tennessee River below Knoxville (Lewis), down to Rathburn, Hamilton Co. (Walker collection), and from the lower Clinch, up to Agee, Campbell Co. (where it intergrades with *conradi*); and it is in French Broad River, at Boyd Creek, Sevier Co.

It is remarkable that this form has not been found in the Holston proper, from Knoxville up to the forks, while the headwaters-form is both in the North and South Fork Holston.

Type locality: "Holston River, Tennessee," which stands apparently for Tennessee River.

24. LEXINGTONIA DOLABELLOIDES CONRADI (Vanatta), 1915.

Unio maculatus Conrad, '35.—*Pleurobema maculatum* Goodrich, '13, p. 94.—*Pleurobema maculatum* Simpson, '14, p. 737.—*Pleurobema appressum* Simpson, '14, p. 747.—*Pleurobema conradi* Vanatta, '15, p. 559.

A form, largely misunderstood. Specimens of this have often been called *U. appressus* Lea, because two specimens are in the U. S. Nat. Mus. with the figured type of *appressus,* but are different from the latter. Also Simpson's *P. appressum* ('14, p. 747) undoubtedly is this, since he quotes Sowerby's figure of *U. argenteus* (Conch. icon. 16. Unio. '66, pl. 37, f. 204), which is a fine representation of this form.

This variety often resembles very much *Pleurobema oviforme* (Conr.) (chiefly such forms which have been called *clinchense* Lea). However, it may be recognized by the subtriangular outline, more forwardly inclined beaks, and the more distinct truncation of the posterior slope. The most important character, however, is seen in the soft parts: in the present form, these are generally deep orange, with the outer gills marsupial, filled, when charged, with *red, subcylindrical* placentæ. These are the characters of the genus *Lexingtonia.* The main species has the same characters, at least in the Clinch; in the French Broad, however, I have found specimens with pale soft parts. But the same tendency has been noticed in other species from the French Broad.

An abundant form in the headwaters of Powell, Clinch, North and South Fork Holston. In the Powell, it goes up to Big Stone Gap, Wise Co., Va., and is also in Puckell Creek at Pennington Gap, Lee Co., Va. In the Clinch, it is found up to Cedar Bluff, Tazewell Co., Va., and down to Clinton, Anderson Co., Tenn., intergrading in the lower part with typical *dolabelloides.* It is everywhere in the

North Fork Holston up to Saltville, Smyth Co., Va., and in the South Fork Holston at Fish Dam (Walker coll.), Emmett, and Bluff City, Sullivan Co., Tenn. However, it does not go down the Holston proper (see above).

Type locality: (of *U. maculatus* Conr.) Elk and Flint rivers, northern Alabama (Conrad's Flint River is in Morgan Co., Ala., and is different from the Flint River in Madison Co., Ala.).

Note: This group of forms is also abundant in the Tennessee drainage in northern Alabama. The typical *dolabelloides* is found in the Tennessee proper, and also in lower Paint Rock River, Flint River (Madison Co.), and Limestone Creek; while the *conradi*-type is found in smaller streams, for instance, in the headwaters of Paint Rock River, the headwaters of Flint River (Madison Co.), Flint River (Morgan Co., according to Conrad), and in Elk River (Conrad).

Genus: PLEUROBEMA Rafinesque (1820).

Ortmann, 1912*b,* p. 261.

25. PLEUROBEMA OBLIQUUM (Lamarck), 1819.

Unio obliqua Lamarck, '19.—*Unio obliquus* Pilsbry & Rhoads, '96.—*Pleurobema obliquum* Ortmann, '12*b,* p. 264 (anatomy).—*Quadrula obliqua* Simpson, '14, p. 881.

This consists of a group of forms very variable in shape, which has been divided into a number of "species." In the upper Tennessee region several of the latter are found, but they all intergrade with each other, and there is very little indication of their separation into geographical or ecological races. Mostly, the various forms are found associated, so that they are hardly more than individual variations.

However, in deference to the nomenclature hitherto accepted, and in view of the fact that in other regions some of these variations become local varieties, I have kept these forms apart.

The typical *P. obliquum* is rather upright, with a distinct radial furrow, and is subtriangular in outline. The nacre is generally white.

This form is quite abundant in the larger rivers, Tennessee, Clinch, Holston, and French Broad. It goes up, in the Clinch, to Union Co., Tenn.; in the Holston, to Grainger Co., Tenn. In the Tennessee proper it is known down to Chattanooga. It is rather strange that it is absent in Lewis's list.

In specimens from the upper section of Holston and Clinch, the radial furrow is quite shallow.

Type locality: Ohio River.

26. PLEUROBEMA OBLIQUUM CORDATUM (Rafinesque), 1820.

Obovaria cordata Rafinesque, '20.—*Unio plenus* Lea, '40.—*Unio plenus* Lewis, '71.—*Quadrula plena* Simpson, '14, p. 886.—*Quadrula cordata* Vanatta, '15, p. 558.—*Pleurobema obliquum plenum* Utterback, '16, p. 77.

I accept the nomenclatural change introduced by Vanatta, since Rafinesque's description and figure can very well be referred to this form.

Upright, more rounded, and more elevated than the normal form, radial furrow less developed.

This is the most poorly marked form of the group, and is found with the main form all over its range, representing merely an individual variation. In the upper Tennessee region it is rather scarce.

Type locality: Ohio River.

27. PLEUROBEMA OBLIQUUM CATILLUS (Conrad), 1836.

Unio catillus Conrad, '36.—*Unio solidus* Lea, '38.—*Quadrula solida* Simpson, '14, p. 885.—*Pleurobema obliquum catillus* Utterback, '16, p. 79.

Subtriangular, rather swollen, with the radial furrow obliterated or absent. Nacre white or reddish.

Individual variation of the main form, all over its range, but quite rare in the upper Tennessee; there are mighty few specimens which show the characters of this form well developed.

In other regions (upper Ohio, and west of the Mississippi) this form assumes frequently the character of a local race, in fact, west of the Mississippi, this, and forms like *P. obliquum rubrum,* prevail, while the form *coccineum* is scarce, and the typical *obliquum* is absent.

Type locality: Scioto River, Ohio.

28. PLEUROBEMA OBLIQUUM COCCINEUM (Conrad), 1836.

Unio coccineus Conrad, '36.—*Pleurobema coccineum* Ortmann, '12*b*, p. 263 (anatomy).—*Pleurobema* sp. ? Goodrich, '13, p. 94.—*Quadrula coccinea* Simpson, '14, p. 883.

A compressed form, typically merely a compressed *catillus,* with the radial furrow absent.

Such forms have been reported hitherto only once from the upper Tennessee by Call (from "Holston River"). I have found only a few of them, corresponding entirely to the *coccineum* of the upper Ohio drainage in Pennsylvania; in the Clinch at Solway, Knox Co., Tenn., and in the Holston at Hodges, Jefferson Co., and at Noeton, Grainger Co., Tenn. They stand very close to the *catillus* forms of this region, representing merely an individual variation of it.

Type locality: Mahoning River, near Pittsburgh (= Mahoning River, Lawrence Co., Pa.).

In addition to the above form, there is, in the upper Clinch, a very peculiar form of this group, not found elsewhere, which may be described as a compressed *obliquum,* with traces of the radial furrow still present. I have seen the soft parts of this (including a gravid female), so that there is no doubt about the affinities of this shell. This form requires further study, and might deserve a varietal name, for it is found, in the Clinch, at, and a good deal above, the upper limit of *P. obliquum.*

In the Walker collection there are several such specimens from Needham's Ford, Union Co., Tenn., and I have it from Clinchport, Scott Co., Va., and from Cleveland, Russell Co., Va.

This form may be more abundant in the poorly known portion of the Clinch from Claiborne and Grainger Cos., through Hancock Co., Tenn., to the Virginia state line.

29. PLEUROBEMA OBLIQUUM RUBRUM (Rafinesque), 1820.

Obliquaria rubra Rafinesque, '20.—*Unio pyramidatus* Lea, '34.—*Unio mytiloides* Lewis, '71.—*Unio pyramidatus* Pilsbry & Rhoads, '96.—*Pleurobema pyramidatum* Ortmann, '12*b*, p. 264 (anatomy).—*Quadrula pyramidata* Simpson, '14, p. 888.—*Quadrula rubra* Vanatta, '15, p. 557.

According to Vanatta, the type of *Obliquaria rubra* Raf. is the same as *U. pyramidatus* of Lea. Since already Conrad ('34 and '36) has brought *rubra* together with *pyramidatus* Lea and his own *mytiloides* (which is *pyramidatus*), this nomenclatural change should be accepted.

Shell oblique, with high, forwardly inclined beaks. Radial furrow more or less developed. Nacre generally red.

Although, in its typical phase, quite distinct from normal *obliquum,* intergrades do exist, and also intergrades toward *cordatum* and *catillus* have been observed.

Also this form generally accompanies *P. obliquum,* but both in Clinch and Holston it ascends the rivers a little farther. In the Clinch, it goes to Oakman, Grainger Co., Tenn., and in the Holston to Austin Mill, Hawkins Co., Tenn. It is abundant and well developed in this region, and of all the forms of the *obliquum* group, it has the best claim to be regarded as a local race.

In the upper Ohio, this form is quite rare, and often not typical. West of the Mississippi are peculiar forms of it, often with the radial furrow quite obliterated.

Type locality: Kentucky River.

GROUP OF PLEUROBEMA OVIFORME.

Also here we meet with a group in which the rule holds good that flat forms of the headwaters are represented, farther down stream, by more swollen forms.

Generally speaking, the *oviforme* group represents, in the upper Tennessee, the *P. clava* of the Ohio drainage, but it is much more variable, and has developed, in the headwaters, a very peculiar, compressed type, which does not find a parallel in the upper Ohio system. All these forms have the characteristic *Pleurobema* anatomy, and resemble very much in this the *P. clava,* although some peculiar variations are observed in the color of certain parts.

As it happens, the oldest name (*oviforme*) has been used for an intermediate form, and thus, in order to retain this in its original sense, it seems advisable to distinguish *three* types within this species: the headwaters form (*argenteum*) has a diameter of less than 40 per cent. of the length; the form of the medium sized rivers (*oviforme*) has a diameter from 40 to 49 per cent.; and the big river form (*holstonense*) has 50 per cent and over.

Also here we see the phenomenon that the headwaters form gains in circumference what it has lost in obesity. The *argenteum* type shows this possibly to the greatest extent; shells of this form reach in length and height dimensions entirely unknown in the more swollen forms.

30. PLEUROBEMA OVIFORME (Conrad), 1834.

Unio oviformis Conrad, '34.—*Unio ravenelianus* Lea, '34.—*Unio patulus* Conrad, '38 (not *patulus* Lea, '29).—*Unio lesleyi* Lea, '60.—*Unio ornatus* Lea, '61.—*Unio clinchensis* Lea, '67.—*Unio conasaugaensis* Lea, '72.—*Unio clinchensis, lesleyi, patulus* Lewis, '71.—*Pleurobema oviforme* Goodrich, '13, p. 94.—*Pleurobema clinchense, lesleyi, oviforme, ornatum, conasaugaense, ravenelianum* Simpson, '14, pp. 743–800.

This resembles much the upper Ohio form of *P. clava,* but is less cuneate, with the beaks less anterior. It is extremely variable in shape, higher or more elongate, and the color pattern is hardly ever alike in any two individuals.

In the Walker collection are topotypes of *U. ravenelianus* Lea (from Asheville): six specimens have the diameter of *oviforme* (40–49 per cent., while one has the diameter of 38 per cent. and the latter would thus fall under *argenteum.* But it has the typical shape of *oviforme.* Since the type of *ravenelianus* has 43 per cent., according to Simpson, we should place this here, and these shells are, indeed, nothing but *oviforme* without rays, of a general dull color (pale brownish, not yellowish). Such specimens are found elsewhere, and several sets in the Walker collection, from Poplar Creek, Roan Co., from the Little Tennessee, Monroe Co., and Cane Creek, McMinn Co., are labeled *ravenelianus.* I have found similar ones in Hiwassee River (passing into *holstonense*). I do not think that these are more than individual variations. However, it might be that within the high mountains of North Carolina, *P. oviforme* generally assumes these characters (dull color and lack of rays), and if so, we might be justified in calling this form by a varietal name (*P. oviforme ravenelianum*).

The figure of *U. conasaugaensis* Lea is an *oviforme* according to diameter, but is an *argenteum* according to shape and size. Since topotypes and authentic material of *conasaugaensis,* examined in the Walker collection, fall partly under *oviforme* and partly under *argenteum,* this is a real intergrade, hard to place.

P. oviforme is widely distributed in all rivers in East Tennessee. In the Tennessee proper it is rare, and is generally represented by the var. *holstonense.* It is in Powell, Clinch, Holston, French Broad, Little Tennessee, and in many of their tributaries, passing in the lower parts of the larger rivers into *oviforme holstonense,* and in the upper parts into *oviforme argenteum.* It is to be noted that *oviforme* goes well into the headwaters, and apparently it does not pass into *argenteum* in some instances. This is chiefly the case in French Broad River, where it goes into the North Carolina mountains (Asheville) without assuming the characteristic features of *argenteum.*

Type locality: Tennessee.

31. PLEUROBEMA OVIFORME ARGENTEUM (Lea), 1841.

Unio argenteus Lea, '41.—*Unio striatissimus* Anthony, Am. Jl. Conch., 1, '65, p. 155.—*Unio planior* Lea, '68.—*Unio brevis* Lea, '72.—*Unio argenteus* Lewis, '72.—*Unio swordianus* Wright, Naut., 11, '97, p. 4.—*Pleurobema fassinans* Ortmann, '13*b,* p. 310 (not *fassinans* of Lea).—*Pleurobema argenteum* Goodrich, '13, p. 94.—*Pleurobema swordianum, argenteum, breve, planius* Simpson, '14, pp. 757–802.—*Pleurobema fassinans* Ortmann, '14, p. 31 (per erroreum).

The soft parts of this form have been described by me under the erroneous name of *P. fassinans.*

Simpson (p. 804) makes *U. striatissimus* Anthony a synonym of *P. estabrookianum* (which actually is *Fusconaia barnesiana bigbyensis*). Specimens from Blount Co., Tenn., received from the Alabama Museum of Nat. Hist. as *striatissimus*, and similar ones with the same label in the Walker collection, agree fully with specimens collected by myself in Little River in Blount Co., and are this form.

Walker has four specimens labeled *P. swordianum* (Wright) from the Wright collection, which thus are authentic specimens. They are all typical *P. oviforme argenteum*. In addition, he has three others from the Sword collection (original lot), of which two are this form, while the third is *Fusconaia pilaris bursa-pastoris*. The type of *swordianum* has, according to Simpson, the diameter of 40 per cent., and thus would stand under *oviforme*. This, however, seems to be an extreme specimen.

This is the compressed form of *oviforme,* peculiar to the headwaters and other small streams. It also generally attains a larger size than the typical *oviforme,* and is more rhomboidal in outline. Lea's only type of *U. argenteus* (examined by myself in Washington) is not a normal specimen; it is tapering behind, which is a character of *oviforme. U. planior* represents the normal shape of this shell, rhomboidal, while *U. brevis* is exactly the same thing, only slightly shorter. The color markings are generally less bright than in *oviforme,* and very often they are obscure or missing, chiefly in old shells.

This variety is found in Powell River from Big Stone Gap, Wise Co., Va. (where it alone is present), downward (associated with *oviforme*); in the Clinch, from Tazewell Co., Va., down to Kyle Ford, Hancock Co., Tenn. (also associated with *oviforme* and intergrading with it). In the Holston drainage it is pure in Big Mocassin Creek, and in the North Fork at Saltville, Smyth Co., and Holston, Washington Co., Va. It is also pure in the Middle Fork at Chilhowie, Smyth Co., in the South Fork at Barron, Washington Co., Va., and in Watauga River at Watauga, Carter Co., Tenn. Farther down, it passes into, and is associated with, *oviforme,* but has not been found in the Holston proper. It is in Little Pigeon River, at Sevierville, Sevier Co., Tenn., but not very well developed here, the majority of the specimens belonging to *oviforme*. In Little River, at Walland and Melrose, Blount Co., Tenn., it is well developed, pure, and not accompanied by *oviforme*. The Little River form has been called *striatissumus*, and it has one peculiarity in the soft parts; they are of the orange type, and the placentæ are red. *P. oviforme argenteum* is also in the tributaries of Hiwassee River (in Conasauga Creek with *oviforme*), and in South Chickamauga Creek, at Ringgold, Catoosa Co., Ga. The latter specimens have, in the average, a greater diameter, resembling that of *oviforme*, but they are stunted in growth (truncated behind). A few of normal shape are clearly *argenteum*. In the larger rivers, this form is missing.

Type locality: Holston River, Tenn. (not recently found in Holston proper).

32. PLEUROBEMA OVIFORME HOLSTONENSE (Lea), 1840.

Unio holstonensis Lea, '40.—*Unio mundus* Lea, '57.—*Unio tesserulæ* Lea, '61.—*Unio pattinoides* Lea, '71.—*Unio acuens* Lea, '71.—*Unio lawi* Lea, '71.—*Unio holstonensis* and *tesserulæ* Lewis, '71.—*Unio bellulus* Lea, '72.—*Unio acuens* and *lawi* Pilsbry & Rhoads, '96.—*Pluerobema holstonense, acuens,* and *tesserulæ* Simpson, '14, pp. 739, 746, 749.

U. mundus, lawi, pattinoides, and *bellulus* have already been recognized by Simpson as synonyms of *P. holstonense*.

This is the swollen, large river form, of *oviforme*. *U. holstonensis, pattinoides, acuens,* and *lawi* are less swollen than the others (*mundus, tesserulæ, bellulus*), but they all pass gradually into each other with regard to obesity.

This form has been reported from the Tennessee below Knoxville, and down to the mussel shoals in northern Alabama; and further from the lower Clinch, the lower Emory River, and the Nolichucky. According to the material examined by the writer, it goes up, in the Clinch, to Edgemoor, Anderson Co., Tenn.; in the Holston, to Mascot, Knox Co., Tenn.; it is in French Broad at Boyd Creek, Sevier Co., Tenn.; in Little Tennessee River, Monroe Co., Tenn. (Walker coll.); and in the Hiwassee at Austral, Polk Co., Tenn. At all these points, near its upper limit, it is associated and intergrades with *oviforme*.

Type locality: Holston River, Tenn. (Simpson says: Tuscumbia, Ala.) (topotypes examined).

Note: The group of *Pleurobema oviforme* is also quite abundant in the Tennessee drainage in North Alabama. Also here the *holstonense*-form is in the Tennessee proper (also in lower part of Paint Rock River and Limestone Creek); in the tributaries, *oviforme* is the prevailing form, and in some of the headwaters, the *argenteum*-form is fully as well developed as in the upper Clinch and Holston, for instance: in Paint Rock River at Princeton, Jackson Co., Ala.; Dry Creek, Holly Tree, Jackson Co., Ala. (tributary to Paint Rock); in Hurricane Creek, Gurley, Madison Co., Ala. (tributary to Flint River); in Elk River, Estill Springs, Franklin Co., Tenn., and its tributary: Boiling River, Cowan, Franklin Co., Tenn.

It should be remarked that in this region also the true *Pleurobema clava* (Lam.) turns up; this species is distinguished by much more anteriorly situated, pointed beaks, swollen anterior part of the shell, and cuneiformly compressed posterior part. The Carnegie Museum has this species from the old Smith collection, labeled Tuscumbia, Ala., and I have seen it also in the Walker coll. from Florence, Ala. In addition, in the latter collection, are specimens from Sequatchie River, at Jasper, Marion Co., Tenn. (Wetherby coll.).

Genus: ELLIPTIO Rafinesque (1820).

Ortmann, 1912*b,* p. 265.

33. ELLIPTIO NIGER (Rafinesque), 1820.

Unio nigra Rafinesque, '20.—*Unio crassidens* Lewis, '71.—*Unio crassidens* Pilsbry & Rhoads, '96.—*Elliptio crassidens* Ortmann. '12*b,* p. 266 (anatomy).—*Unio crassidens* Simpson, '14, p. 606.—*Unio crassidens* Vanatta, '15, p. 555.—*Elliptio nigra,* Utterback, '16, p. 88.

The identity of *U. nigra* Raf. is now firmly established (Say, Conrad, Kuester, Sowerby, and Vanatta), and it is the species commonly called *crassidens.* However, the type of *crassidens* Lamarck, 1819, is not this, but is the *trapezoides* Lea (Frierson, '14*a,* p. 7). Thus Rafinesque's name should be used for the present species.

Everywhere in the larger rivers: Tennessee, Holston, French Broad, Clinch, and Powell; goes up, in the Powell, to Jonesville, Lee Co., Va.; in the Clinch, to Clinchport, Scott Co., Va.; in the Holston to the South Fork at Pactolus, Sullivan Co., Tenn.; in the French Broad, it goes to the Nolichucky at its mouth(Chunn's Shoals, Hamblen Co., Tenn.). It is also in Emory River, up to Harriman Junction, Roan Co., Tenn., and in Hiwassee River, at Kincannon Ferry, Meigs Co., Tenn. In the Tennessee below Knoxville, and down to Chattanooga, it is extremely abundant.

Type locality: Ohio River.

34. ELLIPTIO DILATATUS (Rafinesque), 1820.

Unio dilatatus Rafinesque, '20.—*Unio gibbosus* Lewis, '71.—*Unio gibbosus* Pilsbry & Rhoads, '96.—*Elliptio gibbosus* Ortmann, '12*b*, p. 271 (anatomy).—*Elliptio dilatatus* Ortmann, '13*b*, p. 311. —*Elliptio gibbosus* Goodrich, '13, p. 94.—*Unio gibbosus* Simpson, '14, p. 597.—*Unio dilatatus* Vanatta, '15, p. 555.—*Elliptio dilatata* Utterback, '16, p. 90.

Common, in large rivers as well as in small creeks, possibly the most widely distributed species in the upper Tennessee region, so that it is heardly required to name special localities. However, it should be mentioned that it is one of the species which go up, in French Broad River, to Asheville, Buncombe Co., N. Car. (Walker coll.).

In our region, this species is of moderate size, and purple color of the nacre prevails; only specimens from the French Broad are more frequently white-nacred.

Type locality: Ohio River (the type is from Kentucky River, according to Vanatta).

Genus: LASTENA Rafinesque (1820).

Ortmann, '12*b*, p. 297, and '15, p. 106.

35. LASTENA LATA (Rafinesque), 1820.

Anodonta lata Rafinesque, '20.—*Margaritana dehiscens* Lewis, '71.—*Lastena lata* Goodrich, '13, p. 94.—*Lastena lata* Ortmann, '15, p. 106 (anatomy).—*Lastena lata* Vanatta, '15, p. 554.

Reported from Tennessee River, below Knoxville (Lewis), and the Holston River (Call). I have never found it in the Holston, but only in the Clinch, at Edgemoor and Clinton, Anderson Co., Tenn.; at Oakman, Grainger Co., Tenn. In the Walker collection it is from Clinch River at Clinchport, Scott Co., Va.; and I collected it still farther up at St. Paul, Wise Co., and Cleveland, Russel Co., Va. It is undoubtedly a rare shell.

Type locality: Kentucky River.

Subfamily: ANODONTINÆ Ortmann.

Ortmann, 1910, p. 117.

Genus: LASMIGONA Rafinesque (1831).

Symphynota Lea (1829), Ortmann, '12*b*, p. 280.—*Lasmigona* Frierson, '14*b*, p. 40.

36. LASMIGONIA (SULCULARIA) BADIA (Rafinesque), 1831.

Alasmodon badium Rafinesque, '31.—*Margaritana holstonia* Lewis, '71.—*Symphynota holston*(ia) Goodrich, '13, p. 94.—*Alasmidonta holstonia* Simpson, '14, p. 502.—*Symphynota* (*Sulcularia*) *badia* Frierson, '14*a*, p. 7.—*Symphynota* (*Alasminota*) *holstonia* Ortmann, '14, p. 43 (anatomy).

The subgenus *Alasminota* Ortmann, '14, p. 42, is synonym to *Sulcularia* Rafinesque, '31; see Frierson, l. c.

A characteristic small stream species, abundant locally, and reported by Lewis from small streams in Monroe Co., Tenn., and by Call from tributaries of the Holston in East Tennessee.

The largest streams where I have seen it are the upper Holston proper at Church Hill, Hawkins Co., Tenn., and the Hiwassee, at Austral, Polk Co., Tenn. In both cases the specimens came from a small slough. In the headwater streams, it is in upper Powell, in Va., in the uppermost Clinch in Tazewell Co., Va.; in Little Mocassin Creek, Scott Co., Va.; South Fork Holston at Bluff City, Sullivan Co., Tenn.; Watauga River, Carter Co., Tenn.

Other small streams are the following: Cove Creek, Campbell Co., Tenn. (to Clinch); Bull Run, Knox Co., Tenn. (to Clinch);

Big Creek, Hawkins Co., Tenn. (to Holston); Long Creek, Cocke Co., Tenn. (to French Broad); Little Pigeon River, Sevier Co., Tenn. (to French Broad); First Creek and Third Creek, Knox Co., Tenn. (to Tennessee); Piney River, Rhea Co., Tenn. (to Tennessee); Conasauga Creek, Monroe Co., Tenn. (to Hiwassee); South Chickamauga Creek, Catoosa Co., Ga. (to Tennessee).

Thus this species has practically a universal distribution in our region, but it strictly avoids larger streams.

Type locality: Small streams of the Knobs, Kentucky (headwaters region of Cumberland and Kentucky Rivers).

37. LASMIGONA (LASMIGONA) COSTATA (Rafinesque), 1820.

Alasmidonta costata Rafinesque, '20.—*Margaritana rugosa* Lewis, '71.—*Alasmodonta rugosa* Pilsbry & Rhoads, '98.—*Symphynota costata* Ortmann, '12*b,* p. 283 (anatomy).—*Symphynota costata* Ortmann, '13*b,* p. 311.—*Symphynota costata* Goodrich, '13, p. 94. —*Symphynota* (*Lasmigona*) *costata* Simpson, '14, p. 488.

A common species, most abundant in small and medium-sized streams, rarer in the larger rivers, but not absent there (Tennessee, lower Clinch and Holston). Goes up, in the Powell, to Olinger, Lee Co., Va.; in the Clinch, to Cedar Bluff, Tazewell Co., Va.; it is in Emory River; goes, in North Fork Holston, to Saltville, Smyth Co., Va.; in Middle Fork Holston, to Chilhowie, Smyth Co., Va.; in South Fork Holston, to Barron, Washington Co., Va.; in Watauga, to Johnson City, Washington Co., Tenn. It is also in South Chickamauga Creek, Ringgold, Catoosa Co., Ga.

Type locality: Kentucky River.

Genus: ANODONTA Lamarck (1799).

Ortmann, '12*b,* p. 286.

38. ANODONTA GRANDIS GIGANTEA (Lea), 1834.

Anodonta gigantea Lea, '34.—*Anodonta grandis* (incl. *gigantea*) Ortmann, '12*b,* p. 292 (anatomy).—*Anodonta grandis gigantea* Simpson, '14, p. 420.

No *Anodonta* has ever been reported from the upper Tennessee region. However, in the collection of B. Walker, there are two large specimens of a form of *Anodonta grandis* Say, collected by Mr. M. D. Barber, of Knoxville, in a "small mud pond near French Broad River, 8 miles above Knoxville." The largest has a length of 168 mm., the other of 127 mm. In the latter, the beak sculpture is visible, and corresponds to that of *A. grandis*; it has white nacre, and much resembles specimens of the var. *gigantea* Lea, as found in western Pennsylvania. The other (larger) is a little distorted and tapering behind, and has pale purple nacre, resembling in these characters some of the southern forms of the species.

The occurrence of this form in this isolated locality is quite remarkable, but supports the view that *Anodontas* may possess exceptional means of dispersal. According to more detailed information obtained by Mr. Walker in 1916 from Mr. Barber, the pond is "plainly natural, some 4 or 5 rods long by 2 rods wide, with soft deep mud. There was a small stream of water running to the French Broad River, just a short distance. This was 10 or 11 years ago." "Two years ago, I took a nephew and found the same pond, but although we waded the pond in every direction, up to our knees in mud, we could not find even a fragment of *gigantea*. A man living near there said he had seen large shells in another pond near, but I have not examined it." These ponds, a short distance from the river, probably are on the flood plain of French Broad; the writer has not been able to locate them on the U. S. Geol. Surv. maps.

Type locality: Port Gibson, Claiborne Co., Miss.

Genus: ANODONTOIDES Simpson (1898).

Ortmann, 12*b*, p. 294.

39. ANODONTOIDES FERUSSACIANUS (Lea), 1834.

Anodonta ferussaciana Lea, '34.—*Anodontoides ferussacianus* Ortmann, '12*b*, p. 294 (anatomy).—*Anodontoides ferussacianus* Simpson, '14, p. 467.

Anodonta oblita (?) Lewis, '71, may possibly stand for this species. Lewis doubtfully reports this from the Tennessee below Knoxville, but this probably is a mistake. Originally, *A. oblita* Lea and *Anodonta denigrata* Lea, which are this species, have been described from Campbell Co., Tenn.: this is surely in the Cumberland drainage, since Wilson & Clark report it ('14) from Clear Fork, at Jellico, Campbell Co., Tenn., and other places in the upper Cumberland region in Kentucky (I found it myself in Cumberland River at Orby, Bell Co., Ky.).

In the Walker collection are two specimens from Powell River, Lee Co., Va., collected by G. F. Sword. There is no mistake about them, and thus this species must be listed with the upper Tennessee shells, although known only from a single and somewhat indefinite, locality, and remarkable for its absence all over the rest of this region.

Type locality: Ohio River, Cincinnati, Ohio.

Genus: ALASMIDONTA Say (1818).

Ortmann, '12*b,* p. 294.

40. ALASMIDONTA (PRESSODONTA) MINOR (Lea), 1845.

Margaritana minor Lea, '45.—*Margaritana minor* Lewis, '72.—*Alasmidonta* (*Pressodonta*) *minor* Ortmann, '12*b,* p. 295.—'14, p. 46 (anatomy).—*Alasmidonta minor* Ortmann, '13*b,* p. 311.—*Alasmidonta minor* Goodrich, '13, p. 94.—*Alasmidonta* (*Pressodonta*) *minor* Simpson, '14, p. 498.

A characteristic small creek species, locally abundant. It is found all over the region, but strictly avoids the medium-sized and larger rivers. I have never seen it in the Clinch South of the Va.-Tenn. state line, and never in the Holston proper. I know it from the following stations.

South Fork Powell River, Big Stone Gap, Wise Co., Va.; North Fork Clinch River, Tazewell, Tazewell Co., Va. (Walker coll.); Clinch River, Cedar Bluff, and Richland, Tazewell Co., Va.; Clinch River, Cleveland, Russell Co., Va.; Clinch River, St. Paul, Wise Co., Va.; Clinch River, Speers Ferry, Scott Co., Va.; Brush Fork (tributary to Poplar Creek and Clinch), Marlow, Anderson Co., Tenn.; Big Mocassin Creek, Mocassin Gap, Scott Co., Va.; North Fork Holston River, Saltville, Smyth Co., Va.; Middle Fork Holston River, Chilhowie, Smyth Co., Va.; South Fork Holston River, Barron, Washington Co., Va.; Big Creek (tributary to Holston), Rogerville, Hawkins Co., Tenn. (Walker coll.); Little Pigeon River, Sevierville, Sevier Co., Tenn.; Boyd Creek, Boyd Creek, Sevier Co., Tenn.; Little River, Melrose, Blount Co., Tenn.; Pistol Creek, Rockford, Blount Co., Tenn.; Conasauga Creek, Monroe Co., Tenn. (Walker coll.); South Chickamauga Creek, Ringgold, Catoosa Co., Ga.

Type locality: Tennessee (and "North Carolina," but no exact locality given).

41. ALASMIDONTA (DECURAMBIS) MARGINATA (Say), 1819.

Alasmodonta marginata Say, '19.—*Margaritana marginata* Lewis, '71.—*Alasmodonta marginata* Pilsbry & Rhoads, '96.—*Alasmidonta marginata* Ortmann, '12*b,* p. 297 (anatomy).—*Alasmidonta marginata* Ortmann, '13*b,* p. 311.—*Alasmidonta marginata* Goodrich, '13, p. 94.—*Alasmidonta* (*Rugifera*) *marginata* Simpson, '14, p. 504.

As to the subgenus *Decurambis* Raf., '31, see Frierson, '14*a,* p. 7.

Generally distributed over the whole upper Tennessee region, but apparently more abundant toward the headwaters. Goes, in the Powell, to Olinger, Lee Co., Va.; in the Clinch, to Richland, Tazewell Co., Va.; in the Forks of the Holston, to Saltville and Chilhowie, Smyth Co., Va., and is also in Big Mocassin Creek, Scott Co., Va. Pilsbry & Rhoads report it from Watauga River at Johnson City, Washington Co., Tenn. It is also in Ocoee River, at Ducktown, Polk Co., Tenn. (Walker coll.).

Type locality: Scioto River, Chillicothe, Ohio.

42. ALASMIDONTA (DECURAMBIS) RAVENELIANA (Lea), 1834.

Margaritana raveneliana Lea, '34.—*Alasmidonta* (*Rugifera*) *raveneliana* Simpson, '14, p. 507.

Differs from *A. marginata* chiefly in the absence of rugosities on the posterior slope. However, in very young specimens, traces of them are sometimes seen, so that this characteristic feature of the subgenus *Decurambis* (*Rugifera*) is still indicated. This form undoubtedly is an offshoot of the *marginata*-stock, separated from the rest in the high mountains of North Carolina, and developed there into a good species.

The type locality is French Broad and Swananoa rivers, Asheville, Buncombe Co., N. Car. I have not been able to find this species there, for the French Broad is polluted in this region (lumber industries on Davidson River). But I have rediscovered it in Big Pigeon River, at Canton, Haywood Co., N. Car., where it is not rare at the proper places.

Specimens from "North and South Fork of the Cumberland River," referred to this species, do not belong here, but are a form of *A. marginata,* with well-developed rugosities upon the posterior slope (*atropurpurea* Raf., '31).

Genus: PEGIAS Simpson (1900).

Ortmann, '14, pp. 45 and 65 (as subgenus).

On account of the very peculiar glochidia I consider it better to retain *Pegias* as a genus, closely allied to *Alasmidonta.*

43. PEGIAS FABULA (Lea), 1836.

Margarita (*Margaritana*) *fabula* Lea, '36.—*Alasmidonta fabula* Ortmann, '13*b,* p. 311.—*Alasmidonta* (*Pegias*) *fabula* Ortmann, '14, p. 65 (anatomy).—*Pegias fabula* Simpson, '14, p. 473.

A rare species in the upper Tennessee drainage, apparently preferring smaller streams. Possibly it has been often overlooked on account of its small size and the peculiarity of being generally much eroded. I know it from the following localities.

Wallen Creek, Lee Co., Va. (Walker coll.); Powell River, Dryden, Lee Co., Va.; Big Mocassin Creek, Mocassin Gap, Scott Co., Va.; North Fork Holston River, Saltville, Smyth Co., Va.; North Fork Holston River, Holston, Washington Co. (Walker coll.) and Mendota, Washington Co., Va.; South Fork Holston River, Pactolus, Sullivan Co., Tenn.

Type locality: Cumberland River, Tenn.

Genus: STROPHITUS Rafinesque (1820).

Ortmann, '12*b,* p. 299.

44. STROPHITUS EDENTULUS (Say), 1829.

Alasmodonta edentula Say, '29.—*Anodonta edentula* Lewis, '72.—*Alasmodonta edentula* Pilsbry & Rhoads ,'96.—*Strophitus edentulus* Ortmann, '12*b,* p. 299 (anatomy).—*Strophitus edentulus* Ortmann, '13*b,* p. 311.—*Strophitus edentulus* Goodrich, '13, p. 94.—*Strophitus edentulus* Simpson, '14, p. 345.

Walker thinks that the upper Tennessee-form might be distinguished from the normal *edentulus* as var. *shaefferianus* (Lea). He believes that the latter is more compressed and more projecting anteriorly, and has more frequently reddish nacre. In the average, this appears to be correct, yet there are many specimens in my rich material which do not exhibit these characters, and cannot be distinguished from specimens of the normal *edentulus,* as found, for instance, in western Pennsylvania. Thus I do not think it advisable to separate the two forms.

This species is abundant, both in larger rivers and smaller streams: in the Tennessee, in the lower French Board, the Holston and its forks and tributaries, and all over the Clinch and Powell drainages. It goes up, in the Powell, to Big Stone Gap, Wise Co., Va.; in the Clinch to Cedar Bluff, Tazewell Co., Va.; in the Forks of the Holston, to Saltville, Smyth Co., Va., and Bluff City, Sullivan Co., Tenn.

It has not been found by myself in the eastern tributaries of the Tennessee south of the French Broad, but possibly this is accidental.

Type locality: Wabash River.

Subfamily: LAMPSILINÆ Ortmann, 1910.

Ortmann, '10, p. 118.

Genus: ELLIPSARIA Rafinesque (1820).

Ptychobranchus Simpson, '00.—Ortmann, 12*b,* p. 305.—*Ellipsaria* Frierson, '14*a,* p. 7.

45. ELLIPSARIA FASCIOLARIS (Rafinesque), 1820.

Obliquaria fasciolaris Rafinesque, '20.—*Unio phaseolus* Lewis, '71.—*Unio phaseolus* Pisbry & Rhoads, '96.—*Ptychobranchus* *phaseolus* Ortmann, '12*b,* p. 306 (anatomy).—*Ptychobranchus phaseolus* Goodrich, '13, p. 94.—*Ptychobranchus phaseolus* Simpson, '14, p. 333.—*Ellipsaria fasciolaris* Frierson, '14*a,* p. 7.—*Ptychobranchus fasciolaris* Vanatta, '15, p. 554.

Widely and uniformly distributed over the upper Tennessee region, but nowhere in great numbers. In the Tennessee, French Broad, Holston, Clinch, lower Emory, and Powell. It goes up, in the Powell, to Pennington Gap, Lee Co., Va.; in the Clinch, to Cleveland, Russell Co., Va.; in North Fork Holston, to Mendota, Washington Co., Va.; in South Fork Holston, to Emmett, Sullivan Co., Tenn. It is one of the species which has been reported from French Broad River, at Asheville, Buncombe Co., N. Car. It has not yet been found in Little River, Little Tennessee, and Hiwassee, but it is in South Chickamauga Creek, at Ringgold, Catoosa Co., Ga.

Type locality: "Ohio, Wabash, Kentucky rivers." (The type is from Kentucky River, according to Vanatta.)

46. ELLIPSARIA SUBTENTA (Say), 1825.

Unio subtentus Say, '25.—*Unio subtentus* Lewis, '71.—*Unio subtentus* Pilsbry & Rhoads, '96.—*Ptychobranchus subtentus* Ortmann, '12*b,* p. 308 (anatomy).—*Ptychobranchus subtentus* Ortmann, '13*b,* p. 311.—*Ptychobranchus subtentus* Goodrich, '13, p. 94.—*Ptychobranchus subtentum* Simpson, '14, p. 339.

Known from Tennessee, Powell, Clinch, Holston, and Nolichucky rivers, but more abundant toward the headwaters, and rather rare in the big rivers. Goes up to Big Stone Gap, Wise Co., Va.; to Cedar Bluff, Tazewell Co., Va.; and to Smyth Co., Va. (in North and Middle Fork Holston). Also in Big Mocassin Creek, in Scott Co., Va. Thus it ascends, in the small streams, father than *E. fasciolaris.* In the headwaters it is locally quite abundant.

Type locality: North Fork Holston River (Say says in South Carolina, but this is in Virginia) (topotypes examined).

Genus: OBLIQUARIA Rafinesque (1820).

Ortmann, '12*b,* p. 309.

47. OBLIQUARIA REFLEXA Rafinesque (1820).

Obliquaria reflexa Rafinesque, '20.—*Unio cornutus* Lewis, '71.—*Unio cornutus* Pilsbry & Rhoads, '96.—*Obliquaria reflexa* Ortmann, '12*b*, p. 310 (anatomy).—*Obliquaria reflexa* Simpson, '14, p. 330.

Only in the larger rivers. Tennessee below Knoxville (Lewis), and at Rathburn, Hamilton Co., Tenn. (Walker coll.). Lower Clinch, Patton's Ferry, Roan Co., Tenn. (Pilsbry & Rhoads). I found it in the Clinch at Solway, Knox Co.; Edgemoor and Clinton, Anderson Co., Tenn. In the Walker coll. is a specimen from below Agee, Campbell Co., Tenn.

Type locality: Kentucky River and Letart Falls (according to Vanatta, the types are from the latter place, below Parkersburg, W. Va.).

Genus: CYPROGENIA Agassiz (1852).

Ortmann, 12*b*, p. 312.

48. CYPROGENIA STEGARIA (Rafinesque), 1820.

Obovaria stegaria Rafinesque, '20.—*Unio irroratus* Lewis, '71.—*Unio irroratus* Pilsbry & Rhoads, '96.—*Cyprogenia irrorata* Ortmann, '12*b*, p. 312 (anatomy).—*Cyprogenia irrorata* Simpson, '14, p. 326.—*Cyprogenia stegaria* Vanatta, '15, p. 554.

Known from the Tennessee below Knoxville (Lewis), and the Holston, at Boyd Island, Knox Co. (Pilsbry and Rhoads). It is also in the Tennessee at Rathburn, Hamilton Co., Tenn. (Walker collection). I traced it up, in the Holston, to Turley Mill, Grainger Co., Tenn.; and in the lower Clinch it is quite abundant, going up to Oakman, Grainger Co., Tenn.

Type locality: Ohio River.

Genus: DROMUS Simpson (1900).

Ortmann, '12*b*, p. 314.

49. DROMUS DROMAS (Lea), 1834.

Unio dromas Lea, '34.—*Unio dromas* Lewis, '71.—*Unio dromas* Pilsbry & Rhoads, '96.—*Dromus dromas* Ortmann, '12*b,* p. 315 (anatomy).—*Dromus dromas* Simpson, '14, p. 341.

The typical form is rather swollen, and has a large knob or hump on each valve. This knob, however, is very variable.

This form is found in the Tennessee proper. It has been reported by Lewis from below Knoxville, and by Pilsbry and Rhoads from Chattanooga, Hamilton Co. It is in the Walker collection from Chattanooga and from Rathburn, Hamilton Co. Pilsbry and Rhoads report it also from the Holston, at Boyd Island, near Knoxville. I found it only in the Tennessee, three miles below Knoxville.

There are occasional specimens, which might be called by this name, in the lower Clinch and Holston, but in this region it is generally replaced by the next form, with which it intergrades.

Type locality: Harpeth River, Tenn. (and Cumberland River, Nashville, Tenn.).

50. DROMUS DROMAS CAPERATUS (Lea), 1845.

Unio caperatus Lea, '45.—*Unio caperatus* Lewis, '71.—*Dromus caperatus* Simpson, '14, p. 343.

This form has lost the "hump," and it is more compressed than the normal form. It begins in the Tennessee at Knoxville (Lewis), and ascends both the Clinch and Holston, where it intergrades, in the lower parts, with typical *D. dromas.* In the Holston, it goes up to Holston Station, Grainger Co., Tenn., and in the Clinch, it goes to Clinch River Station, Claiborne Co., Tenn. It enters also the Powell, and goes up to Shawanee, Claiborne Co., Tenn.

It is quite abundant in the Holston in Knox and Jefferson Cos., although it is frequently associated here with the typical form, and intergrades with it. Its metropolis, however, is in the Clinch from Anderson Co. upward, and in the Powell, where it is a pure race.

Type locality: Clinch River (topotypes examined).

Note: The tendency to develop here a more compressed form in the smaller rivers agrees entirely with the similar phenomenon observed in species of *Fusconaia,* etc.

Genus: OBOVARIA Rafinesque (1820).

Ortmann, 12*b,* p. 320.

51. OBOVARIA (OBOVARIA) RETUSA (Lamarck), 1819.

Unio retusa Lamarck, '19.—*Obovaria retusa* Ortmann, '12*b,* p. 321 (anatomy).—*Obovaria* (*Obovaria*) *retusa* Simpson, '14, p. 290.

Reported by Call from the Holston River in east Tennessee, but missing in Lewis's list. There are specimens in the Carnegie Museum (from the Smith collection) labeled: Tennessee River, Knox Co., Tenn.; and others in the Walker collection labeled: Holston River, Knox Co., and Holston River, Knoxville, Tenn. In all these cases, apparently, the Tennessee River at and below Knoxville is meant. I found this species only once: a young specimen in Clinch River, at Clinton, Anderson Co., Tenn.

In the Walker collection are also specimens from the Tennessee at Bridgeport, Jackson Co., Ala., and from Florence, Lauderdale Co., Ala. (also reported by Hinkley).

Thus this species seems to belong to the upper Tennessee fauna, going up to Knoxville and into the lower Clinch; but it apparently is very rare.

Some of my specimens of *O. subrotunda* from the Holston (Mascot) have slighly incurved beaks and purple nacre, and resemble *O. retusa* to a dergee. Already Wilson and Clark ('14) have indicated a similar approaching of the two species in Cumberland River.

Type locality: ? (Nova Scotia per errorem).

52. OBOVARIA (OBOVARIA) SUBROTUNDA (Rafinesque), 1820.

Obliquaria subrotunda Rafinesque, '20.—*Unio circulus* Lewis, '71.—*Unio circulus* Pilsbry & Rhoads, '96.—*Obovaria circulus* Ortmann, '12*b* (anatomy).—*Obovaria* (*Obovaria*) *circulus* Simpson, '14, p. 291.—*Obovaria subrotunda* Vanatta, '15, p. 552.

The identity of *Obliquaria subrotunda* and *Obovaria striata* Rafinesque with *U. circulus* Lea has been recognized by Conrad in 1834, who selected *subrotunda* as name, which thus must be used.

Apparently rare in the upper Tennessee region. Reported from the Tennessee below Knoxville (Lewis), and at Knoxville (Call, and Pilsbry & Rhoads). I know it only from the Holston River at Mascot, Knox Co., where I found three specimens with the diameter of 60, 61 and 62 per cent. of the length. These must be placed with typical *subrotunda* (diameter 60 per cent. and over). A fourth specimen, found associated with these has the diameter of 55 per cent., and should be called *O. subrotunda levigata* (which see).

In this region, there is evidently no tendency of this form to go into the small streams of the headwaters, although my specimens from the Holston indicate an inclination toward the small stream form *levigata.*

Type locality: Ohio River (type from Kentucky River, according to Vanatta).

53. OBOVARIA (OBOVARIA) SUBROTUNDA LEVIGATA (Rafinesque), 1820.

Unio levigata Rafinesque, '20.—*Obovaria* (*Obovaria*) *lens* Simpson, '14, p. 293.—*Obovaria levigata* Vanatta, '15, p. 552.

Already Conrad (1834) has seen that *levigata* Raf. is the same as *lens* Lea.

This is the small stream form of the main species, distinguished by greater compression of the shell (diameter less than 60 per cent. of the length). It is quite abundant in the tributaries of the Tennessee below the Walden Gorge (Sequatchie River, Tenn., Flint River and Hurricane Creek, Madison Co., Ala., Elk River and Bear Creek). It intergrades here with the main species, as it does in the upper Ohio region.

From above the Walden Gorge, I have it from South Chickamauga Creek, Ringgold, Catoosa Co., Ga. From the headwaters region, above Knoxville, I have just two specimens from the Holston, one from Mascot, another from Holston Station, Grainger Co., in which the diameter falls under 60 per cent. (to 55 per cent. in the first, to 57 per cent. in the other). I have never seen a trace of this form in the small streams of this region.

Type locality: Kentucky River.

Genus: NEPHRONAIAS Fischer & Crosse (1893).[1]

Ortmann, '12*b*, p. 324.

54. NEPHRONAIAS LIGAMENTINA GIBBA (Simpson), 1900.

Unio ligamentinus Lewis, '71.—*Unio ligamentinus* Pilsbry & Rhoads, '96.—*Nephronaias ligamentina* (incl. *gibba*) Ortmann, '12*b*, (anatomy).—*Nephronaias ligamentina gibba* Goodrich, '13, p. 94.—*Lampsilis ligamentina gibba* Simpson, '14, p. 82.

The main species is not represented in the upper Tennessee region, although occasional specimens turn up, which are hard to distinguish from it. The var. *gibba* is extremely abundant in all the larger rivers: Powell, Clinch, Holston, French Broad, Tennessee, but in the upstream direction it disappears before it reaches the headwaters region. In the Powell, it has been observed up to Shawanee, Claiborne Co., Tenn.; in the Clinch, up to St. Paul, Wise Co., Va.; in the North Fork Holston, up to Holston Bridge, Scott Co., Va.; in the South Fork, up to Pactolus, Sullivan Co., Tenn. From the French Broad it also enters the lower part of the Nolichucky, at Chunn's Shoals, Hamblen Co., Tenn.

Type locality: "Ohio River and southward."

55. NEPHRONAIAS PECTOROSA (Conrad), 1834.

Unio pectorosus Conrad, May, '34.—*Unio perdix* Lea, August, '34. —*Unio biangularis* Lea, '40.—*Unio biangulatus* Lea, '43.—*Unio biangulatus* Lewis, '71.—*Unio biangularis* Pilsbry & Rhoads, '96. —*Nephronaias perdix* Ortmann, '12*b*, p. 326 (anatomy).—*Nephronaias perdix* Ortmann, '13*b*, p. 311.—*Nephronaias perdix* Goodrich, '13, p. 94.—*Lampsilis biangularis* and *perdix* Simpson, '14, pp. 59 and 88.

The date of publication of *U. perdix* Lea is incorrectly given by Simpson as 1827. There is no question that *biangularis* and *perdix* are the same species, and it is quite astonishing that this identity has not been recognized by Simpson. Recently, Frierson has suggested to me that *vittatis* Rafinesque, 1831, from Greene River, Ky., might be this species. However, I hesitate to accept this, till it has been shown that this species actually exists in Greene River.

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[1] Possibly the generic name should be changed to *Actinonaias*; compare Frierson, Nautilus, 31, 1917, p. 48.

N. pectorosa is found in the Tennessee below and at Knoxville (Lewis, Pilsbry & Rhoads), but it seems to be rare there. Farther up, it goes into Clinch, Powell, Holston, French Broad, and lower Nolichucky, and it is also in Little River. It ascends toward the headwaters farther than does *N. ligamentina gibba,* and goes, in the Powell, to Pennington Gap, Lee Co., Va.; in the Clinch to Cleveland, Russell Co., Va.; in North Fork Holston, to Saltville, Smyth Co., Va.; in South Fork Holston, to Barron, Washington Co., Va.; and in the Watauga, to Watauga, Carter Co., Tenn. Just in the region, where *N. ligamentina gibba* begins to disappear (north of the Va.-Tenn. state line), *N. pectorosa* is most abundant and in its best development.

Type locality: Elk River, North Alabama.

Genus: AMYGDALONAIAS Fischer & Crosse (1893).

Ortmann, '12*b,* p. 327.

56. AMYGDALONAIAS TRUNCATA (Rafinesque), 1820.

Truncilla truncata Rafinesque, '20.—*Unio elegans* Lewis, '71.—*Amygdalonaias elegans* Ortmann, '12*b,* p. 328 (anatomy).—*Plagiola* (*Amygdalonaias*) *elegans* Simpson, '14, p. 307.—*Plagiola elegans* Vanatta, '15, p. 553.—*Amygdalonaias truncata* Utterback, '16, p. 148.

Vanatta does not accept Rafinesque's specific name on account of *Unio truncata* Spengler, 1793. However, these do not conflict (Walker, '16).

Not abundant, and missing in the headwaters. Tennessee below Knoxville (Lewis); Clinch River, Solway, Knox Co.; Edgemoor and Clinton, Anderson Co.; Black Fox Ford, Union Co.; Clinch River Station, Claiborne Co.; Oakman, Grainger Co., Tenn. Holston River, McBee Ford, near Hodges, Jefferson Co., Tenn.

Type locality: Ohio River (type from Falls of the Ohio, according to Vanatta).

Genus: PLAGIOLA Rafinesque (1820).

Ortmann, '12*b,* p. 329.

57. PLAGIOLA LINEOLATA (Rafinesque), 1820.

Obliquaria lineolata Rafinesque, '20.—*Unio securis* Lewis, '71.—*Unio securis* Pilsbry & Rhoads, '96.—*Plagiola securis* Ortmann, '12*b,* p. 329 (anatomy).—*Plagiola* (*Plagiola*) *securis* Simpson, '14, p. 304.—*Plagiola lineolata* Vanatta, '15, p. 553.—*Plagiola securis* Walker, '16, p. 45.

Of the names of Rafinesque (*depressa, lineolata,* and *ellipsaria*) given to this species, *lineolata* has been selected by Conrad in 1834. (Walker, l. c.) This name has been used also by Say, Agassiz, and Call.

Only in the larger rivers. Tennessee at and below Knoxville, also at Rathburn, Hamilton Co., Tenn. (Walker collection). In the Clinch at Patton's Ferry, Roane Co. (Pilsbry & Rhoads), and at Offutt, Anderson Co., Tenn. Rare.

Type locality: Falls of the Ohio.

Genus: PARAPTERA Ortmann (1911).

Ortmann, '12*b,* p. 330.

If the first species (*leptodon*) should actually belong here, the generic name must be dropped in favor of *Leptodea* Rafinesque, '20 (see Frierson, '14*a,* p. 6). Utterback ('16, p. 151) uses *Lasmonos* Raf.

58. PARAPTERA LEPTODON (Rafinesque), 1820.

Unio leptodon Rafinesque, '20.—*Unio tenuissimus* Lewis, '71.—*Lampsilis* (*Proptera*) *leptodon* Simpson, '14, p. 188.—*Lampsilis leptodon* Vanatta, '15, p. 551.—*Lasmosos leptodon* Utterback, '16, p. 156.

A rare shell. Lewis gives it from the Tennessee below Knoxville. In the Walker collection it is from the Clinch, at Needham Ford, Union Co., Tenn., and I found it in the Clinch at Edgemoor, Anderson Co., Tenn. I found it also in the Holston at Holston Station and Noeton, Grainger Co., Tenn.

Type locality: Lower Ohio River (Vanatta says that the type is from Kentucky River).

59. PARAPTERA FRAGILIS (Rafinesque), 1820.

Unio fragilis Rafinesque, '20.—*Unio gracilis* Lewis, '71.—*Unio gracilis* Pilsbry & Rhoads, '96.—*Paraptera gracilis* Ortmann, '12*b,* p. 331 (anatomy).—*Lampsilis* (*Proptera*) *gracilis* Simpson, '14, p. 181.—*Leptodea* (*?*) *fragilis* Frierson, '14*a,* p. 7.—*Lampsilis fragilis* Vanatta, '15, p. 552.—*Lasmonos fragilis* Utterback, '16, p. 152.

In the larger rivers, not rare. Tennessee River, below Knoxville (Lewis) and Holston River, Boyd Island, near Knoxville (Pilsbry & Rhoads). In the lower Nolichucky at Chunn's Shoals, Hamblen Co.; up the Holston to Holston Station, Grainger Co.; in the Clinch up to Clinch River Station, Claiborne Co.; in the Powell River, up to Combs, Claiborne Co., Tenn.

Type locality: Ohio River (the type is, according to Vanatta, from creeks in Kentucky).

Genus: PROPTERA Rafinesque (1819).

Ortmann, '12*b,* p. 332.

60. PROPTERA ALATA (Say), 1817.

Unio alatus Say, '17.—*Unio alatus* Lewis, '71.—*Unio alatus* Pilsbry & Rhoads, '96.—*Proptera alata* Ortmann, '12*b,* p. 333 (anatomy).—*Lampsilis* (*Proptera*) *alata* Simpson, '14, p. 162.

Common in the larger rivers: Tennessee in Knox Co.; goes up the Clinch to Clinchport, Scott Co., Va.; up the Powell, to Combs, Claiborne Co., Tenn.; it reaches the North Fork Holston at its mouth, at Rotherwood, Hawkins Co., Tenn. It is also in French Broad River, and in the lower part of the Nolichucky at Chunn's Shoals, Hamblen Co., Tenn.

Type locality: ?

Genus: TOXOLASMA Rafinesque (1831).

Corunculina (error typ.) Simpson, '98.—*Carunculina* Ortmann, '12*b,* p. 337; '14, p. 68.—*Toxolasma* Frierson, '14*a,* p. 7.

61. TOXOLASMA LIVIDUM (Rafinesque), 1831.

Unio lividus Rafinesque, '31.—*Unio moestus* Lea, '41.—*Unio cylindrellus* Lea, '68.—*Unio glans* Lewis, '71.—*Unio glans* Pilsbry & Rhoads, '96.—*Lampsilis* (*Carunculina*) *cylindrella* and *moesta* Simpson, '14, pp. 155, 156.—*Toxolasma livida* Frierson, '14*a*, p. 7.

The upper Tennessee form is not the real *U. glans* of Lea ('43), as already hinted at by Pilsbry & Rhoads. The latter is more swollen, and has more inflated beaks, and possibly, it is the big river and lowland form of *Toxolasma lividum.*

What Lea has described as *U. moestus* (from French Broad River, Tenn.) undoubtedly is this: I have specimens from Little Pigeon River (tributary to French Broad), which are fully identical with *moestus. U. cylindrellus* Lea (Duck River, Tenn.) is in shape absolutely identical with *T. lividum*; however, it differs by paler color of epidermis and nacre. Such pale specimens occasionally are found in the upper Tennessee drainage as individual variations. Yet it might be, that elsewhere (Tennessee drainage in northern Alabama, and Alabama drainage in Alabama and Georgia) this pale form becomes a distinct race.

U. pullus Conrad, '38, from the original locality, Wateree River, S. Car., may be a different species. But it is rather sure that the specimens from "Warm Springs, N. Car." (=Hot Springs, Madison Co., N. Car., on the French Broad) are actually *T. lividum.*

There is great variation in the color of the nacre: it may be entirely dark purple, or may have (generally) a whitish margin along the edge of the shell; or it may (very rarely) have a pale, yellowish, color. The epidermis is mostly blackish or blackish brown, but it may become pale brown or greenish brown.

This species seems to have a wide range over the upper Tennessee drainage, but, on the other hand, it seems to be rather local. I know it from the following localities: South Fork Powell River, Big Stone Gap, Wise Co., Va. (Walker coll.); Powell River, Jonesville, Lee Co., Va. (Walker coll.); Shawanee, Claiborne Co., Tenn. (Walker coll.); Green's Ford, Union Co., Tenn. (Walker coll.); Clinch River, Speer's Ferry, Scott Co., Va.; Emory River, Harriman, Roane Co., Tenn.; North Fork Holston River, at Saltville, Smyth Co. (O. A. Peterson), and at Holston, Washington Co., Va. (Walker coll.); Holston Bridge, Scott Co., Va. (Walker coll.); Holston River, Rogersville (=Austin Mill), Hawkins Co., Tenn. (Walker coll.); Little Pigeon River, Sevierville, Sevier Co., Tenn.; Pistol Creek, Rockford, Blount Co., Tenn. In addition, it is in Lewis's list from the Tennessee below Knoxville.

Type locality: Rockcastle River, Ky. Its actual presence in Rockcastle River, at Livingston, Rockcastle Co., Ky., has recently been confirmed by Williamson (as *U. glans,* see: Ohio Naturalist, 5, 1905, p. 311). Wilson & Clark, '14, do not give it from this place, but I have seen specimens in the Walker coll. from this locality.

Note: This form is also present in the tributaries of the Tennessee in North Alabama, as has been indicated long ago by Conrad. It also seems to be represented in the Alabama drainage, but from this region it generally goes under the name of *corvunculus* Lea, '68. I have a number of specimens of the latter before me, which I cannot distinguish from the upper Tennessee form.

Genus: LEMIOX Rafinesque (1881).

Frierson, '14*a*, p. 7.—Ortmann, '16, p. 39.

62. LEMIOX RIMOSUS (Rafinesque), 1831.

Unio rimosus Rafinesque, '31.—*Unio cœlatus* Lewis, '71.—*Micromya cœlata* Goodrich, '13, p. 94.—*Micromya cœlata* Simpson, '14, p. 34.—*Lemiox rimosus* Frierson, '14*a*, p. 7.—*Lemiox rimosus* Ortmann, '16, p. 39 (anatomy).

This species has been reported from the Tennessee below Knoxville (Lewis), and from Powell, Clinch, and Holston rivers (Call). It seems to have a wide distribution, but it is found nowhere in great numbers, and is thus a rare shell. In the Powell, it goes up to Jonesville, Lee Co., Va.; in the Clinch, to St. Paul, Wise Co., Va.; in the North Fork Holston, to Holston, Washington Co., Va. It is found here and there in the Holston proper and the lower Clinch, but I have never seen it in the eastern tributaries of the Holston-Tennessee system.

Type locality: Cumberland River (not reported from the Cumberland drainage by Wilson & Clark, '14).

Genus: MEDIONIDUS Simpson (1900).

Ortmann, '12*b*, p. 334; '15, p. 143.

63. MEDIONIDUS PLATEOLUS (Rafinesque), 1831.

Unio plateolus Rafinesque, '31.—*Unio conradicus* Lewis, '71.—*Unio conradianus* Pilsbry & Rhoads, '96.—*Medionidus conradicus* Ortmann, '12*b*, p. 335, and '15, p. 142 (anatomy).—*Medionidus conradicus* Ortmann, '13*b*, p. 311.—*Medionidus conradicus* Goodrich, '13, p. 94.—*Medionidus conradicus* Simpson, '14, p. 247.

The identity of *U. plateolus* and *conradicus* Lea ('34) has been suggested to me by Frierson, and I think, this is correct.

Very abundant in the headwaters and in small streams generally, but quite rare in the larger rivers. It has been found practically all over our region, and often goes up into the smallest streams which contain at all Nayades. It is hardly worth while to record single localities, and it suffices to say that it is in the Powell, Clinch, and Holston, and their tributaries; in the French Broad, it goes up to Asheville, N. Car.; it is in Little River, and in South Chickamauga Creek, Ga. From the Tennessee proper, below Knoxville, it has been reported by Lewis.

Type locality: Falls of the Cumberland River. (Its existence at this place, below the falls, has been confirmed by Wilson & Clark, '14.)

Genus: EURYNIA Rafinesque (1820).

Ortmann, '12*b*, p. 336.

64. EURYNIA (MICROMYA) FABALIS (Lea), 1831.

Unio fabalis Lea, '31.—*Unio fabalis* Lewis, '71.—*Eurynia (Micromya) fabalis* Ortmann, '12*b*, p. 339 (anatomy)—*Eurynia fabalis* Goodrich, '13, p. 94.—*Micromya fabalis* Simpson, '14, p. 33.

Rather rare, but possibly in part overlooked. Lewis gives it from Tennessee River, below Knoxville, and the Walker collection has it from Tennessee River, Little River Shoals, Knox Co., Tenn. I found it chiefly toward the headwaters, in Powell, Clinch, and Holston. In the Powell, it goes up to Combs, Claiborne Co., Tenn.; in the Clinch, to Cleveland, Russell Co., Va.; in the North Fork Holston, to Hilton, Scott Co., Va.; in the South Fork, to Pactolus, Sullivan Co., Tenn. It seems to be absent from the eastern tributaries of the system.

Type locality: Ohio River.

65. Eurynia (Micromya) trabalis (Conrad), 1834.

Unio trabalis Conrad, '34.—*Eurynia* (*Micromya*) *trabalis* Ortmann,

Extremely rare. I found a single specimen in Clinch River, at Speer's Ferry, Scott Co., Va.; another one in South Chickamauga Creek, Ringgold, Catoosa Co., Ga.; and three specimens in Hiwassee River, at Austral, Polk Co., Tenn. At the first locality, it was associated with the next species.

The only difference of *E. trabalis* and *perpurpurea* is, that the former has white, the latter purple nacre. The specimens from the Hiwassee are exceptionally large, and do not taper so much behind as usual.

This species seems to have its metropolis in the Cumberland system (Wilson & Clark, '14). Call cites it from Clinch and Powell Rivers in Tennessee, but Lewis does not mention it from the "Holston" (=Tennessee), and I have never seen a trace of it in the whole Holston drainage. According to Hinkley, it is rare in the mussel shoals of the Tennessee in Alabama; the Carnegie Museum has one specimen from Paint Rock River, at Paint Rock, Jackson Co., Ala. It may be that my localities in Chickamauga Creek and Hiwassee River are connected with the range in northern Alabama.

Type locality: ?

66. Eurynia (Micromya) perpurpurea (Lea), 1861.

Unio perpurpurea Lea, '61.—*Eurynia perpurpurea* Ortmann, '13*b*, p. 311.—*Eurynia purpurpurea* Goodrich, '13, p. 94.—*Lampsilis perpurpurea* Simpson, '14, p. 133.—*Eurynia* (*Micromya*) *perpurpurea* Ortmann, '15, p. 63 (anatomy).

'12*b*, p. 340 (anatomy).—*Lampsilis trabalis* Simpson, '14, p. 132.

This may be only a variety with purple nacre of *E. trabalis,* but I have not yet seen any intergrades.

It is characteristic for the Clinch River, where it is not rare in Virginia (from Speer's Ferry, Scott Co., up to Cedar Bluff, Tazewell Co.). In addition, it is in the Powell at Olinger, Lee Co., Va. (Walker coll.); in the North Fork Holston, from Rotherwood, Hawkins Co., Tenn., to Mendota, Washington Co., Va.; and in Emory River, Harriman, Roane Co., Tenn.

In the Tennessee and Holston proper, and their eastern mountain tributaries, no trace of this species has ever been found.

Type locality: Tennessee.

67. EURYNIA NEBULOSA (Conrad), 1834.

Unio nebulosus Conrad, '34.—*Unio cumberlandianus* Lea, '36.—*Unio cumberlandicus* Lea, '38.—*Unio notatus* Lea, '38.—*Unio glaber* Lea, '38.—*Unio creperus* Lea, '38.—*Unio muehlfeldianus* Lea, '38.—*Unio simus* Lea, '38.—*Unio obscurus* Lea, '38.—*Unio zeiglerianus* Lea, '38.—*Unio amœnus* Lea, '40.—*Unio fatuus* Lea, '40.—*Unio dactylus* Lea, '40.—*Unio tener* Lea, '40.—*Unio regularis* Lea, '41.—*Unio puniceus* Haldeman, '42.—*Unio radians* Lea, '57.—*Unio jonesi* Lea, '59.—*Unio discrepans* Lea, '60.—*Unio scitulus* Lea, '60.—*Unio linguæformis* Lea, '60.—*Unio perpictus* Lea, '60.—*Unio planicostatus* Lea, '60.—*Unio sparus* Lea, '68.—*Unio dispansus* Lea, '71.—*Unio glaber, iris, cumberlandianus, jonesi, sparus* Lewis, '71, and '72.—*Unio muhlfeldtianus* Pilsbry & Rhoads, '96.—*Eurynia nebulosa, dispansa,* and *planicostata* Ortmann, '13*b,* p. 311.—*Eurynia nebulosa* Goodrich, '13, p. '94.—*Eurynia* (*Micromya*) *nebulosa* Ortmann, '15, p. 64 (anatomy).

Simpson, '14, has recognized the identity of a great number of these nominal "species," but not of all of them. He gives (pp. 119 and 120): *cumberlandianus* (Cumberland R., Tenn.); *notatus* (Cumberland and Holston R., Tenn.); *glaber* (Holston R., Tenn.); *radians* (Othcalooga Cr., Gordon Co., Ga.); *jonesi* (Euharlee Cr., Ga.); *discrepans* (North Alabama); *scitulus* (Tuscumbia, Ala.); *linguæformis* (Columbia, Ga., and French Broad R., Tenn.); *perpictus* (Bull R.

and Holston R.); *sparus* (Swamp Cr., Whitfield Co., Ga.), and I am fully convinced that all these actually are synonyms of *nebulosus*. But I believe that there are many others, and on account of the extraordinary size of the list of synonyms, I think it advisable to make a few remarks as to these.

U. creperus Lea, '38 (Tennessee), made a synonym of *L. iris* (Lea) by Simpson (p. 115), is founded upon an old half shell, hardly recognizable, but it may be this. In the Walker collection is a specimen from Clinch R., Va. (Wright), labeled *creperus*, which is distinctly *E. nebulosa*. It is a male, has purple nacre, and distinct, rather broad, only slightly interrupted rays.

U. dispansus Lea, '71 (east Tennessee), has been put by Simpson (p. 106) in the synonymy of *L. vanuxemensis*; I think it belongs here.

U. puniceus Haldeman, '42 (Simpson, p. 104) (Holston R., Washington Co., Va.). I have found forms corresponding to the description in the same region (topotypes), and they simply are *E. nebulosa* with a peculiar reddish-orange nacre.

U. obscura Lea, '38 (Nashville, Tenn.), and *U. zeiglerianus* Lea, '38 (Cumberland R., Tenn.), made synonyms by Simpson (p. 117) are also this, with rather fine, uninterrupted rays, and purple nacre.

U. fatuus Lea, '40 (Holston R., Tenn.), and *U. dactylus* Lea, '40 (Caney Fork R., Tenn.), made synonyms by Simpson (pp. 116, 117), are rather elongated and unusually swollen forms of *E. nebulosa*, with the rays less developed, and not interrupted.

U. planicostatus Lea, '60 (Tuscumbia, Ala.) (Simpson, p. 117). A strongly compressed male, with rays distinct, rather wide, and little interrupted. Such specimens are frequent, chiefly in the Clinch.

U. muehlfeldianus Lea, '38 (Cumberland R., Tenn.) (Simpson, p. 121). According to Simpson, only a single specimen is known, which is undoubtedly this, probably a female. Pilsbry & Rhoads give this also from Watauga R., near Johnson City, Washington Co., Tenn.: near this place (Watauga, Carter Co.), I have found *E. nebulosa*.

U. amœnus Lea, '40 (Holston R., Tenn.) (Simpson, p. 122). A typical female of *E. nebulosa*.

U. tener Lea, '40 (Big Pigeon R., Tenn.) and *U. regularis* Lea, '41 (French Broad R., Tenn.), made synonyms by Simpson (pp. 122, 123). There are two specimens (♂ and ♀) in the Walker collection, labeled *tener* (from French Broad, Asheville, N. Car.). They are rather thin-shelled, have rays, which are fine, and subcontinuous in the male, but somewhat spotted in the female. They undoubtedly are a form of *E. nebulosa.*

U. simus Lea, '38 (Cumberland R., Tenn.) (Simpson, p. 123). A male, with strongly developed rays: specimens of this type occur frequently, and are practically identical with *U. notatus,* admitted by Simpson as a synonym of *nebulosus.*

This tremendous synonym indicates that we have to deal here with a very variable species. The variation concerns first of all the color pattern of the epidermis (rays). In the second line it is shown in the color of the nacre, the shape of the shell, and, of course, sometimes the females have been made "species" for the reason of their different shape. It is not excluded that additional synonyms may be discovered.

E. nebulosa belongs in the affinity of *E. iris* (Lea), '30, and has practically the same anatomy. Indeed, some of its forms are hardly distinguishable from *E. iris,* and it may be that the latter is only the western and northwestern representative of it (that of the Ohio drainage). Thus it is also explained why *iris* has been recorded for the upper Tennessee River (Lewis).

According to my observations, there is only *one* species of the *iris*-group in the upper Tennessee region. It is generally an elongated-elliptical shell, more or less pointed behind in the male, slightly dilated and rounded posteriorly in the female, of a yellowish, greenish, or brownish color, covered more or less with rays, which normally are well developed, and very often broken up into spots. These rays may be fine or wide (in the female, they are often very broad and distinct on the dilated part of the shell), may cover all of the shell, or only part of it, and may be indistinct or nearly missing. The interior of the shell may be white, or of all shades of salmon, orange, pink, or purple.

Although I have tried hard, I have been unable to separate this group of forms into species, and it is also impossible for me to distinguish local races. It is true that sometimes specimens from a certain locality, chiefly from some small creeks, show uniform and peculiar characters, but this holds good only for short distances. In the longer rivers (Powell, Clinch, Holston) the variation is considerable and irregular, apparently without any recognizable rules.

The distribution of *E. nebulosa* extends over the whole of the upper Tennessee region, but the species decidedly favors the headwaters and small streams, and often goes up to the uppermost limit of Nayad-distribution in this region. It is not necessary to give a list of the localities: it is practically everywhere in the Powell, Clinch, Holston, French Broad, Little River, Hiwassee. (It apparently is only accidental that it has not been recorded from the Little Tennessee.) It is also in Chickamauga Creek, and it deserves special mention that it goes up, in French Broad, to Asheville, N. Car.

In the larger rivers, this species is rare, yet it is present.

In addition, *E. nebulosa* has a wide range not only in the Cumberland drainage, but also in that of the Tennessee in North Alabama, and it also has invaded the headwaters of the Coosa-Alabama system in northern Georgia and Alabama. It is very singular that Wilson & Clark ('14) do not mention it in their paper on the Cumberland shells, although a good number of the synonyms have their type locality in this system.

Type locality: Black Warrior River, Ala.

68. EURYNIA (MICROMYA) VANUXEMENSIS (Lea), 1838.

Unio vanuxemensis Lea, '38.—*Unio nitens* Lea, '40.—*Unio umbrosus* Lea, '57 (=*umbrans* Lea, '57).—*Unio tenebricus* Lea, '57.—*Unio pybasi* Lea, '58.—*Unio fabaceus* Lea, '61.—*Unio copei* Lea, '68.—*Unio pybasi* Lewis, '71.—*Unio pybasi* and *caliginosus* Pilsbry & Rhoads, '96.—*Eurynia* (*Micromya*) *vanuxemensis* Ortmann, '12*b*, p. 342.—'15, p. 65 (anatomy).—*Nephronaias copei* and *Eurynia vanuxemensis* Ortmann, '13*b*, p. 311.—*Eurynia vanuxemensis* Goodrich, '13, p. 95.—*Lampsilis vanuxemensis* Simpson, '14, p. 105.

Unio dispansus Lea, '71, placed by Simpson here, belongs to *E. nebulosa* (see above). Probably there are other synonyms.

This shell is shorter and higher than *E. nebulosa,* has generally a dark epidermis with indistinct or no rays, and a deep copper-colored or purplish nacre; rarely the latter is lighter, and even when whitish, it has at least some purple or red. The female is characterized by a very strong dilatation of the postbasal margin, and very often, chiefly in old shells, it has a strong "constriction" behind this dilatation.

The distribution of this species is very similar to that of *E. nebulosa,* preferring also the small streams, and very often the two species are found associated. Also here it is unnecessary to give a list of localities, and it suffices to state that it is found practically over the whole upper Tennessee region. It should be remarked, however, that I did not find it in the headwaters of the Clinch (above Speer's Ferry, Va.), but it may have been overlooked here. While locally abundant in smaller streams, it becomes rare in the larger rivers.

Also here, local races cannot be distinguished, except that the shell attains, in certain streams, a much greater size than in others. This is the case, for instance, in the Middle Fork Holston in Smyth Co., Va., where exceptionally large specimens (*U. copei* Lea) are found, while the North Fork contains a small race. Specimens of larger rivers are also generally rather large and well developed, and often lack, in the ♀, the posterior constriction. Such specimens have a resemblance to *U. lienosus* Conrad, being more drawn out at the posterior end. *U. lienosus* is a southern form, not found in the Tennessee drainage. There is no doubt that *U. caliginosus* Lea (=*lienosus*), recorded by Pilsbry & Rhoads from the lower Clinch, is founded upon such specimens.

Also this species has a wide distribution in the Cumberland drainage, the Tennessee drainage in Alabama, and the Coosa-Alabama system, and it is very likely that also the form of the Cumberland, questionably referred to *lienosa* by Wilson & Clark ('14), is this.

Type locality: Cumberland River, Tenn.

69. EURYNIA (EURYNIA) RECTA (Lamarck), 1819.

Unio rectus Lamarck, '19.—*Unio rectus* Lewis, '71.—*Unio rectus* Pilsbry & Rhoads, '96.—*Eurynia* (*Eurynia*) *recta* Ortmann, '12*b*, p. 344 (anatomy).—*Eurynia recta* Goodrich, '13, p. 95.—*Lampsilis recta* Simpson, '14, p. 95.

Abundant in the larger rivers: Tennessee in Knox Co., lower

French Broad and lower Nolichucky (Hamblen Co.); all the way up the Holston to the North Fork at Rotherwood, Hawkins Co., Tenn. Also in the Clinch up to St. Paul, Wise Co., Va., and the Powell up to Combs, Claiborne Co., Tenn.

Type locality: Lake Erie (topotypes examined).

Note: The Lake Erie form differs somewhat from that of the central basin. If it should be found to be desirable to express this in nomenclature, *E. recta* should be reserved for the lake form, and *E. recta latissima* (Rafinesque), '20, should be used for the other.

Genus: LAMPSILIS Rafinesque (1820).

Ortmann, '12*b*, p. 345.

70. LAMPSILIS VIRESCENS (Lea), 1858.

Unio virescens Lea, '58.—*Lampsilis virescens* Simpson, '14, p. 93.

I am not quite satisfied as to the proper position of this species within the genus *Lampsilis*. According to external appearance, it seems to be related to *L. luteola* (Lam.), although it also has some features, which resemble those of *L. teres* (Raf.) (=*anodontoides* Lea). In either case, however, it would be a *Lampsilis*.

The *type locality* is Tennessee River, Tuscumbia, Colbert Co., Ala., and it has been reported, by Call, from Spring Creek at Tuscumbia. The Carnegie Museum has it from tributaries of the Tennessee in northern Alabama (Paint Rock River, and Bear Creek). It has never been found anywhere else.

But I have found a few specimens (all males) in Emory River, at Harriman, Roane Co., Tenn., and in the Walker collection are others from Coal Creek, Anderson Co., Tenn. These two streams are not far apart, and flow from Walden Ridge to the Clinch. Emory River is the only western tributary which completely cuts through Walden Ridge and drains, in its headwaters, a section of the Cumberland Plateau.

71. LAMPSILIS OVATA (Say), 1817.

Unio ovatus Say, '17.—*Unio ovatus* Lewis, '71.—*Unio ovatus* Pilsbry & Rhoads, '96.—*Lampsilis ovata* Ortmann, '12*b*, p. 350 (anatomy).—*Lampsilis ovata* Simpson, '14, p. 48.

Distinguished by the distinct and sharp posterior ridge, depressed (truncated) posterior slope, and the peculiar, wedge-shaped anterior part of the shell. But these characters gradually pass into those of the variety *ventricosa*.

The typical *L. ovata* is restricted to the larger rivers, and quite abundant there. It is in the Tennessee, the Little Tennessee, Holston, Clinch, and Powell. In the Powell, it goes up to Shawanee, Claiborne Co., Tenn.; in the Clinch, to Clinchport, Scott Co., Va. It is the prevailing form in the Holston proper, but does not go into the Forks of the Holston. All along its range, and chiefly *above* Knoxville, it is accompanied by the var. *ventricosa,* and intergrades with it. But at the points just named, it disappears, and leaves the field to *ventricosa.*

Type locality: Ohio River.

72. LAMPSILIS OVATA VENTRICOSA (Barnes), 1823.

Unio ventricosa Barnes, '23.—*Lampsilis ventricosa* Ortmann, '12*b,* p. 351 (anatomy).—*Lampsilis ovata ventricosa* Ortmann, '13*b,* p. 311.—*Lampsilis ovata ventricosa* Goodrich, '13, p. 95.—*Lampsilis ventricosa* Simpson, '14, p. 38.

According to Vanatta ('15, p. 551), the type of *Lampsilis cardium* Rafinesque, '20, is this, and also Conrad ('34) says so. However, this conflicts with Rafinesque's description, from which it is evident that *L. cardium* is the female of *L. ovata.* We have here a case where the "type" does not agree with the original description, and it should be borne in mind that the co-called "types" of Rafinesque, in the Philadelphia Academy, are not types in the strict sense, but merely "authentic specimens" of somewhat doubtful value.

In this variety, the posterior ridge becomes indistinct, the posterior slope is not excavated, and the anterior part of the shell is not remarkably compressed. Also, the shell is generally less convex. But there are all stages of transition. The upper Tennessee form of *ventricosa* very rarely has the distinct rays of the corresponding form of the upper Ohio region.

L. ovata ventricosa is found associated with the normal *L. ovata* in the larger rivers, but is less frequent there. It goes, however, beyond the upper limit of *L. ovata* in the headwaters, where it is found in its best development and as a pure race. In the Powell, it goes to Olinger, Lee Co., Va.; in the Clinch, to Cedar Bluff, Tazewell Co., Va.; in North Fork Holston, to Saltville, Smyth Co., Va. (also in Big Mocassin Creek); and in the South Fork, to Emmett, Sullivan Co., Tenn. It is in Nolichucky River, at Chunn's Shoals, Hamblen Co., Tenn. (inclining here toward *ovata*); in Little Pigeon River, Sevierville, Sevier Co., Tenn.; in Little River, Melrose, Blount Co., Tenn.; and in Emory River, Harriman, Roane Co., Tenn. I have seen it also in Chickamauga Creek, Ringgold, Catoosa Co., Ga.

Type locality: Wisconsin River, and Mississippi River, Prairie du Chien, Wis.

73. LAMPSILIS FASCIOLA Rafinesque (1820).

Lampsilis fasciola Rafinesque, '20.—*Unio multiradiatus* and *perradiatus* Lewis, '71.—*Unio multiradiatus* Pilsbry & Rhoads, '96.—*Lampsilis multiradiata* Ortmann, '12*b*, p. 352 (anatomy).—*Lampsilis multiradiata* Ortmann, '13*b*, p. 311.—*Lampsilis multiradiata* Goodrich, '13, p. 95.—*Lampsilis multiradiata* Simpson, '14, p. 55.

Also in this case, I do not follow Vanatta's ('15, p. 551) determination of the "type" of *fasciola*, but rely on Rafinesque's description, which indicates a shell of the *cardium-ovata* type, with unequal, flexuous rays, which fits *multiradiata* Lea, but not *luteola* Lamarck. Moreover, Conrad, in 1836, held the same opinion, also pointing out the undulated rays as the main character of this species.

Practically everywhere in the larger rivers as well as in smaller streams, but apparently more abundant toward the headwaters. In the Tennessee, South Chickamauga, Hiwassee, Little Tennessee, Little River. In the French Broad drainage, going up here to Asheville, N. Car., and, in Big Pigeon River, to Canton, N. Car. In the Holston, up to the South Fork at Barron, Washington Co., Middle Fork at Chilhowie, Smyth Co., and North Fork at Saltville, Smyth Co., Va. Also in Big Mocassin Creek, and Watauga River. In the Clinch, it goes up to Cedar Bluff, Tazewell Co., Va.; in the Powell, to the North Fork at Big Stone Gap, Wise Co., Va. Also in the Emory at Harriman, Roane Co., Tenn.

Type locality: Kentucky River.

74. LAMPSILIS ORBICULATA (Hildreth), 1828.

Unio orbiculatus Hildreth, '28.—*Lampsilis orbiculata* Ortmann, '12*b,* p. 343 (anatomy).—*Lampsilis orbiculata* Simpson, '14, p. 76.

Not reported previously from the upper Tennessee region, but in the Walker collection are two specimens labeled "Holston R., Tenn.," which come from the Lewis collection (and thus probably are from the Tennessee). I have found myself two specimens in the Clinch, one at Offutt, Anderson Co., the other at Solway, Knox Co., Tenn.

This species is also in the Tennessee in North Alabama, at the mussel shoals near Florence (reported by Hinkley, and represented in Walker coll. and Carnegie Mus.).

Type locality: Muskingum River, Marietta, Ohio.

Genus: TRUNCILLA Rafinesque (1820).

Ortmann, '12*b,* p. 354.

The subgenera distinguished by Simpson require revision, also with regard to nomenclature. I disregard them for the present, remarking only that the soft parts furnish good criteria for their definition.

75. TRUNCILLA TRIQUETRA Rafinesque, 1820.

Truncilla triqueter Rafinesque, '20.—*Unio triangularis* Lewis, '71.—*Unio triangularis* Pilsbry & Rhoads, '96.—*Truncilla triquetra* Ortmann, '12*b,* p. 355 (anatomy).—*Truncilla triquetra* Simpson, '14, p. 5.

Rather frequent both in larger and smaller rivers, but nowhere in great numbers. Tennessee below Knoxville (Lewis) and at Knoxville (Pilsbry & Rhoads); Little River in Knox Co. (Walker coll.); lower Nolichucky; Holston River up to the South Fork at Pactolus, Sullivan Co., Tenn., and the North Fork at Mendota, Washington Co., Va.; in the Clinch up to Clinchport, Scott Co., Va.; in the Powell, up to Shawanee, Claiborne Co., Tenn.

Type locality: Falls of the Ohio.

76. TRUNCILLA ARCÆFORMIS (Lea), 1831.

Unio arcæformis Lea, '31.—*Unio arcæformis* Lewis, '71.—*Unio arcæformis* Pilsbry & Rhoads, '96.—*Truncilla arcæformis* Simpson, '14, p. 12.

In the larger and medium rivers: Tennessee, Knox Co., Tenn.; French Broad at Boyd Creek, Sevier Co. In the Holston locally abundant: Boyd Island, near Knoxville (Pilsbry & Rhoads); McMillan, Knox Co.; Mascot, Knox Co.; Gant Island near Strawberry Plains, Jefferson Co. (Walker coll.); McBee Ford, near Hodges, Jefferson Co.; Turley Mill, Noeton, and Holston Station, Grainger Co.; Austin Mill, Hawkins Co., Tenn. In the Clinch at Clinch River Station, Claiborne Co.; and Oakham, Grainger Co., Tenn.

Type locality: "Tennessee River." Lea (Tr. Amer. Philos. Soc., 1834, p. 86) corrects this, saying that, according to Troost, this species is not in the Tennessee, but only in the Cumberland River (meaning, of course, the Tennessee of northern Alabama).

77. TRUNCILLA INTERRUPTA (Rafinesque), 1820.

Obliquaria interrupta Rafinesque, '20.—*Unio brevidens* Lea, '31 (not '34, as given by Simpson).—*Unio brevidens* Lewis, '71.—*Truncilla brevidens* Simpson, '14, p. 7.

The identity of Rafinesque's species with that of Lea has been recognized by Conrad, accepted by Kuester and Reeve, and confirmed by Vanatta ('15, p. 550). But Vanatta does not use the name of *interrupta,* for reasons which do not hold good, as shown by Walker ('16, p. 45). The only objection to *interrupta* is that it is given, originally, from Kentucky and Ohio rivers, while it seems to be absent at least from the Ohio. But we must remember that Lea's *brevidens* also was originally given from Ohio, corrected subsequently, '34, to Cumberland River.

In the larger and medium rivers: Tennessee (Lewis), Holston, Clinch, and Powell. In the Powell, up to Rose Hill, Lee Co., Va.; in the Clinch, up to Clinchport, Scott Co., Va.; in the Holston up to the North Fork at Hilton, Scott Co., Va.

Type locality: "Kentucky and Ohio Rivers." (Probably incorrect; type from Ohio River, according to Vanatta.)

78. TRUNCILLA LENIOR (Lea), 1843.

Unio lenior Lea, '43.—*Truncilla lenior* Simpson, '14, p. 11.

A rare species. I have found it in the Clinch, Speer's Ferry, Scott Co., Va.; in North Fork Holston, Rotherwood, Hawkins Co., Tenn.; in South Fork Holston, Pactolus, Sullivan Co., Tenn.; and in the uppermost Holston proper, Church Hill, Hawkins Co., Tenn.

There are specimens in the Walker coll. (from Mrs. Andrews), labeled: Holston River, Knox Co. (probably Tennessee River), but Lewis has not recorded it from these parts. For the rest, it is missing in this region, but it turns up again in the Tennessee drainage in North Alabama: Simpson gives it from Paint Rock River, Woodville, Jackson Co., Ala., and the Carnegie Museum possesses quite a number of specimens from this river at Paint Rock, Holly Tree, and Trenton, Jackson Co., Ala.

The male of this species may be easily recognized by the fine denticles on the margin of the posterior end; for the rest, it looks like a pale-colored *Eurynia nebulosa*.

Type locality: Stones River, Tenn. (Cumberland drainage; but missing in the list of Cumberland shells published by Wilson & Clark, '14).

79. TRUNCILLA HAYSIANA (Lea), 1833.

Unio haysianus Lea, '33.—*Unio haysianus* Lewis, '71.—*Unio haysianus* Pilsbry & Rhoads, '96.—*Truncilla haysiana* Ortmann, '12*b*, p. 357 (anatomy).—*Truncilla haysiana* Ortmann, '13*b*, p. 311.—*Truncilla haysiana* Goodrich, '13, p. 95.—*Truncilla haysiana* Simpson, '14, p. 16.

Widely distributed, but always only in small numbers at a given locality. Tennessee in Knox Co. (Lewis) and at Knoxville (Pilsbry & Rhoads); Little Tennessee, Coytee, Loudon Co., Tenn. (Walker coll.); in the Powell, up to Pennington Gap, Lee Co., Va.; in the Clinch, up to Raven, Tazewell Co., Va.; in the Holston, it goes in the North Fork to Hilton, Scott Co., Va., and in the South Fork to Pactolus, Sullivan Co., Tenn.

Type locality: Cumberland River.

80. TRUNCILLA STEWARDSONI (Lea), 1852.

Unio stewardsoni Lea, '52.—*Unio stewardsoni* Lewis, '71.—*Truncilla stewardsoni* Simpson, '14, p. 21.

I think that what Walker ('10*a*, pl. 3, f. 4) has figured as the ♂ of *T. lewisi* is actually an old ♂ of *stewardsoni.*

A rare species. The Carnegie Museum has specimens from the Tennessee at Knoxville, and Lewis reports it from this region; and there are also specimens from Clinch River, Clinton, Anderson Co., in the Carn. Mus. I found it myself in the Holston, at McMillan and Mascot, Knox Co., and at Holston Station, Grainger Co., Tenn.

Type locality: "Chattanooga River, Tenn." There is no such river in Tennessee. Generally, Lea's "Chattanooga River" is the Chattooga River in northern Georgia (tributary to Coosa); but in the present instance this cannot be, since this species is not found in the Coosa drainage.

81. TRUNCILLA LEWISI Walker (1910).

Unio foliatus Lewis, '71.—*Truncilla lewisi* Simpson, '14, p. 20.

As stated above, Walker's figure of the ♂ ('10*a*, pl. 3, f. 4) probably belongs to *T. stewardsoni.*

I have found a single small male specimen (soft parts examined!) in the Holston, at Holston Station, Grainger Co., Tenn., and another, somewhat larger one, in the Powell, at Combs, Claiborne Co., Tenn. These differ from the male of *T. stewardsoni* by a wider radial furrow, with the two ridges confining it, more divergent. My specimens are not full grown, and even if they should be young females (as Walker suggested after examination of the one from the Holston), they would present to us the shape of the male, as all young females do in the genus *Truncilla,* exactly as the soft parts of young females resemble those of the males.

The Carnegie Museum has (from the Hartman coll.) two females, labeled: Tennessee River, Knox Co., Tenn. Lewis gives this form (as *U. foliatus*) from the Tennessee at Little River Shoals, below Knoxville; and Walker reports it from Clinch and Holston rivers in Knox Co. (also from Cumberland River, Burnside, Pulaski Co., Ky., but not found here by Wilson & Clark, '14).

Thus this is undoubtedly one of the rarest species of *Truncilla,* and its distribution should be studied more closely.

Type locality: Holston River, Tenn. (topotype examined).

82. TRUNCILLA PROPINQUA (Lea), 1857.

Unio propinquus Lea, '57.—*Unio propinquus* Lewis, '71.—*Unio propinquus* Pilsbry & Rhoads, '96.—*Truncilla propinqua* Simpson, '14, p. 27.

Reported, by Lewis, from Tennessee River, Knox Co., and from the Clinch by Call. Pilsbry & Rhoads give it from the Tennessee at Knoxville, the Holston at Boyd Island, near Knoxville, and from the Clinch at Patton's Ferry, Roane Co. The Carnegie Museum possesses it from the Tennessee, Knox Co. (Smith coll.), and I found it myself in the Clinch at Edgemoor and Clinton, Anderson Co., Tenn.

Type locality: Florence and Tuscumbia, Ala. (topotypes examined).

83. TRUNCILLA TORULOSA (Rafinesque), 1820.

Amblema torulosa and *gibbosa* Rafinesque, '20.—*Unio perplexus* Lewis, '71.—*Truncilla perplexa* Simpson, '14, p. 24.—*Truncilla torulosa* Vanatta, '15, p. 550.

The identity of *torulosa* and *gibbosa* with *perplexus* has been indicated by Conrad ('34), and he selected the name of *torulosa.* Although he later ('36) uses *gibbosus* (and so do Agassiz and Reeve), the first selection has to stand.

The typical *T. torulosa* has a radial row of prominent knobs across the middle of the shell. But these knobs vary greatly, and in the upstream direction, they have the tendency to become reduced, finally disappearing, thus passing into the condition seen in the next form.

Restricted to the larger rivers. It turns up in the Tennessee at and below Knoxville (Lewis), and continues down the river, but is hardly found above Knoxville. The Carnegie Museum has three young specimens from near Knoxville (Hartman coll.), which have distinct knobs. In addition, there is a specimen from Chattanooga, Hamilton Co., Tenn. (Juny coll.), which is typical in all respects, except that it has salmon-colored nacre; to my knowledge, this color of the nacre is extremely rare.

Farther down the Tennessee, at the mussel shoals in Alabama, this species is abundant (Conrad, Hinkley, and Carn. Mus.).

Type locality: Ohio River and Kentucky River (the type is from Kentucky River, according to Vanatta).

84. TRUNCILLA TORULOSA GUBERNACULUM (Reeve), 1865.

Unio gubernaculum Reeve, Conch. icon. 16. Unio. '65, pl. 28, f. 146.

Reeve's figure undoubtedly is this form. Simpson ('14, p. 26) makes this a synonym of the var. *rangiana* (Lea), and it surely is the parallel form to *rangiana* of the upper Ohio drainage. It differs, however, distinctly by the dark green color of the posterior expansion of the female shell.

From the typical *torulosa,* this variety differs by the poorly developed or wanting knobs, and by the rather more compressed shell.

This is the headwaters form of *torulosa,* and begins to take its place in the region of Knoxville. I have it from the Nolichucky, Chunn's Shoals, Hamblen Co.; here, as also in the lower Holston, faint knobs may yet be present. Farther up, the shell is entirely smooth. In the Holston, it goes up to the South Fork at Pactolus, Sullivan Co., Tenn., and to the North Fork at Holston Bridge, Scott Co., Va. In the Clinch, it goes to Dungannon, Scott Co., Va. It is also in the Powell, up to Shawanee, Claiborne Co., Tenn. Locally, it may be quite abundant.

Type locality: ?

85. TRUNCILLA TURGIDULA (Lea), 1858.

Unio turgidulus Lea, '58 (male).—*Unio deviatus* Reeve, '64 (female).—*Truncilla deviata* Walker, '10*b,* pp. 77, 78, 81.—*Truncilla deviata* Simpson, '14, p. 31.

Unio turgidulus has been regarded as the male of the female *U. florentinus,* but it belongs to the female *deviatus.* In Walker's key (10*b*), this has been indicated by the grouping, but it has not been expressly mentinoned.

T. turgidula stands nearest to *T. biemarginata* (Lea), a species known from the Tennessee in North Alabama, but which has not yet been recorded from the upper Tennessee. *T. turgidula* agrees with the latter in the biangulate posterior ridge, but the biangulation is much less pronounced, and the depression or furrow in front of it is less developed. In the female (*deviatus*), the biangulation is also present, but indistinct, and the furrow is obliterated, being filled by the expansion of the shell. The female resembles, to a degree, that of *T. florentina*, but has the shell, as Simpson states, more elongated, and has fuller and higher beaks (the latter characters hold also good for the male).

This species has been recorded from Cumberland and Tennessee rivers (not recently found by Wilson & Clark, '14, in Cumberland), and from Duck River, Tenn. (Call), but only one definite locality is known (Florence, Lauderdale Co., Ala.). Hinkley reports it from Shoals Creek, Lauderdale Co., Ala. The Carnegie Museum has it from Bear Creek, in Franklin Co., Ala. I have found it in the upper Tennessee drainage, where it is not rare in the Holston proper from Knox Co. up to Austin Mill, Hawkins Co., Tenn. I found it also in Emory River, Harriman, Roane Co., Tenn. In the Walker coll. it is represented from the Holston, Rogersville, which is practically the same locality as Austin Mill.

Type locality: Cumberland River and Florence, Ala.

86. TRUNCILLA FLORENTINA (Lea), 1857.

Unio florentinus Lea, '57.—*Truncilla florentina* Simpson, '14, p. 30 (excl. *turgidulus*).

This species has not a biangulate posterior ridge, but this ridge is rounded, and the radial depression in front of it is hardly developed, indicated only by a flattening of the shell. In the female, the posterior expansion of the shell may become very large, and is generally of the color of the rest of the shell, or lighter, but not uniformly dark green, as in *T. capsæformis*. By the latter character, by the more strongly developed and more numerous denticulations of the margin of the expansion, and by the greater convexity of the shell, *T. florentina* is distinguished from *capsæformis*. The male of *T. florentina* is shorter, higher, and more swollen than that of *T. capsæformis*.

Known from the Cumberland and Tennessee Rivers, from the latter, however, reported hitherto only from North Alabama. I have found it in the Holston, from Knox Co., up to Holston Station, Grainger Co., Tenn., but not in great numbers.

Type locality: Florence, Ala. (and Cumberland River) (topotypes examined).

87. TRUNCELLA WALKERI Wilson & Clark (1914).

Truncilla walkeri Wilson & Clark, '14, p. 46, pl. 1, f. 1.

This is practically a large, compressed *T. florentina.* It agrees with it in every respect, except that it attains a larger size, and is as compressed as *T. capsæformis.* It may be only the headwaters form of *T. florentina.*

From *T. capsæformis* it is distinguished by larger size, and by the absence of any dark green tints (except rays) upon the posterior expansion of the female. Also the denticulations on the margin of the expansion are stronger and more numerous. Wilson & Clark do not mention these denticulations: but his specimens seem to have been more or less mutilated in this region. My specimens, belonging to the type set, show only traces of them, while the fine material I collected myself in the headwaters of the Holston shows them well developed.

The males of *T. walkeri* and *capsæformis* are very similar: that of *walkeri* is possibly somewhat larger and of a lighter color, yellowish brown, with light green rays, while that of *capsæformis* is greenish olive, with dark green rays. But these differences are rather uncertain. However, I was never put to the task of separating them, since I have never found the two species associated.

T. walkeri is very local in the upper Tennessee region. I found it only in the South Fork Holston at Emmett, Sullivan Co., Tenn., and at Barron, Washington Co., Va. (Walker has it from Barron); and further, I found it in Middle Fork Holston, at Chilhowie, Smyth Co., Va. At the latter place it was not rare.

In addition, the Carnegie Museum has it from Flint River and Hurricane Creek at Gurley and Maysville, Madison Co., Ala. There are also specimens at hand from the type locality.

Type locality: East Fork Stones River, Walterhill, Rutherford Co., Tenn. (cotypes examined).

88. TRUNCILLA CAPSÆFORMIS (Lea), 1834.

Unio capsæformis Lea, '34.—*Unio capsæformis* Lewis, '71.—*Truncilla florentina* and *capsæformis* Ortmann, '12*b*, p. 359 (anatomy).—*Truncilla capsæformis* Ortmann, '13*b*, p. 311.—*Truncilla capsæformis* Goodrich, '13, p. 95.—*Truncilla capsæformis* Simpson, '14, p. 29.

The specimen of "*florentina*," of which I have described the anatomy, was actually a *capsæformis*.

Distinguished from the two preceding species by the combination of the following characters: shell rather compressed, with the beaks not much elevated; expansion of the female uniformly dark green, with only small, few, and remote denticles on the margin.

There are differences in the soft parts of *T. turgidula, florentina, walkeri,* and *capsæformis,* which will be discussed elsewhere.

T. capsæformis is very abundant in the upper Tennessee drainage, all over the region. It is in the Tennessee below Knoxville, in Powell, Clinch, Holston, Nolichucky, Little Pigeon, and goes up, in the French Broad, to Asheville, N. Car. (Walker coll.). It is also in Little Tennessee, at Coytee, Loudon Co., Tenn. (Walker coll.). In the Powell, it has been traced up to Shawanee, Claiborne Co., Tenn.; in the Clinch, to Cedar Bluff, Tazewell Co., Va.; in the North Fork Holston, to Mendota, Washington Co., Va. (also in Big Mocassin Creek); in the South Fork Holston, it is at Pactolus, Sullivan Co., Tenn., but not farther up.

Type locality: Cumberland River.

The above enumeration contains nearly all nominal species ever recorded from the upper Tennessee region. However, there are yet two additional ones, which have not been mentioned:

UNIO ABACUS Haldeman (1824)—Holston River, Tenn.

Pleurobema abacus Simpson, '14, p. 810.

A spurious species, which never has been positively recognized. Specimens under this name in the Lea collection (U. S. Nat. Mus.)

are, as Simpson states, much like "*Pleurobema appressus*," that is to say, *Lexingtonia dolabelloides conradi* (Van.). I have examined these in Washington. Also specimens in the Walker collection, labeled *abacus*, from Flint River, Gurley, Madison Co., Ala., are this.

MARGARITANA QUADRATA Lea (1861)—Eastern Tennessee.

Symphynota quadrata Simpson, '14, p. 487.

The type is lost. This species never has been recognized. I have the suspicion, from description and figure, that it is identical with *Alasmidonta minor* (Lea), 1845.

LIST OF LOCALITIES, AND OF THE NAYAD-FORMS FOUND AT THEM.

The following list is submitted for two reasons: first, to give an idea of the richness of the material upon which this paper is founded; second, to facilitate, for subsequent collectors, the search for certain forms. There will be a time, not far distant, when the fauna of many of the localities will have deteriorated or disappeared in consequence of stream pollution, and thus it is important to know all the localities where a given form has been found. The exact location of all the collecting stations is given on the accompanying map, so that also a change of local geographic nomenclature will not interfere. (See page 523.)

The localities have been arranged according to river systems, beginning in the northwest (Powell), and proceeding downstream and eastward. The smaller streams not belonging to the headwaters, have been placed together at the end of each system. The Tennessee proper stands at the end of the list.

Forms found intergrading at one locality are connected by *braces*. In several instances of well-known and easily recognized species, I have not taken home specimens at certain localities, but only seen them (mostly dead shells). These are marked "*seen*." The record of this fact always was made in the field with actual specimens before me, and is absolutely reliable.

POWELL DRAINAGE.

North Fork Powell River, Big Stone Gap, Wise Co., Va.

Walker coll. (C. C. Adams, Sept. 4, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. barnesiana bigbyensis*
3. *Medionidus plateolus*
4. *Eurynia nebulosa*
5. *Lampsilis fasciola*

South Fork Powell River, Big Stone Gap, Wise Co., Va.

*=Walker coll. (Adams, Sept. 4, '99); †= Carnegie Mus. (Ortmann, May 15 and Sept. 6, '13).

†1. *Fusconaia pilaris bursa-pastoris*
†2. *F. barnesiana*
*†3. *F. barnesiana bigbyensis*
†4. *Lexingtonia dolabelloides conradi*
*†5. *Pleurobema oviforme argenteum*
†6. *Lasmigona badia*
†7. *Alasmidonta minor*
†8. *Strophitus edentulus*
†9. *Ellipsaria subtenta*
*10. *Toxolasma lividum*
*†11. *Medionidus plateolus*
*†12. *Eurynia nebulosa*
†13. *E. vanuxemensis*

Powell River, Olinger, Lee Co., Va.

Walker coll. (Adams, Sept. 5, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cuneolus*
3. *F. barnesiana bigbyensis*
4. *Lexingtonia dolabelloides conradi*
5. *Pleurobema oviforme*
6. *Elliptio dilatatus*
7. *Lasmigona costata*
8. *Alasmidonta marginata*
9. *Ellipsaria subtenta*
10. *Medionidus plateolus*
11. *Eurynia perpurpurea*
12. *E. nebulosa*
13. *Lampsilis ovata ventricosa*

Powell River, Dryden, Lee Co., Va.

*=Walker coll. (Adams, Sept. 3, '99); †=Carn. Mus. (Ortmann, Sept. 7, '13).

†1. *Fusconaia pilaris bursa-pastoris*
†2. *F. barnesiana*
*†3. *F. barnesiana bigbyensis*
*†4. *Lexingtonia dolabelloides conradi*
†5. *Pleurobema oviforme*
*†6. *Elliptio dilatatus*
†7. *Lasmigona badia*
*†8. *L. costata*
†9. *Alasmidonta marginata*
†10. *Pegias fabula*
†11. *Strophitus edentulus*
*†12. *Ellipsaria subtenta*
*†13. *Medionidus plateolus*
*†14. *Eurynia nebulosa*
*†15. *E. vanuxemensis*
†16. *Lampsilis ovata ventricosa*
*†17. *L. fasciola*

Cane Creek, Pennington Gap, Lee Co., Va.

Walker coll.

1. *Fusconaia pilaris bursa-pastoris*
2. *Pleurobema oviforme*

Puckell Creek, Pennington Gap, Lee Co., Va.

Walker coll.

1. *Fusconaia cuneolus*
2. *Lexingtonia dolabelloides conradi*
3. *Pleurobema oviforme*

Wallen Creek, Lee Co., Va. (near Jonesville).

* = Walker coll.; † = Carn. Mus. (from G. H. Clapp).

*1. *Fusconaia barnesiana bigbyensis*
†2. *Elliptio dilatatus*
*3. *Pegias fabula*
*4. *Medionidus plateolus*
†5. *Eurynia nebulosa*

Powell River, Lytton Mill, Pennington Gap, Lee Co., Va.

Walker coll. (Adams, Sept. 1, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cor analoga*
3. *F. barnesiana bigbyensis*
4. *Quadrula cylindrica strigillata*
5. *Lexingtonia dolabelloides conradi*
6. *Pleurobema oviforme*
7. *Elliptio dilatatus*
8. *Lasmigona costata*
9. *Ellipsaria fasciolaris*
10. *Nephronaias pectorosa*
11. *Eurynia nebulosa*
12. *E. vanuxemensis*
13. *Lampsilis fasciola*
14. *Truncilla haysiana*

Powell River, Jonesville, Lee Co., Va.

* = Walker coll.; † = Carn. Mus. (Hartman coll.).

*1. *Fusconaia pilaris bursa-pastoris*
*2. *Pleurobema oviforme*
*3. *Elliptio niger*
*4. *Ellipsaria subtenta*
*5. *Toxolasma lividum*
*†6. *Lemiox rimosus*

Powell River, Rose Hill, Lee Co., Va.

Walker coll. (Adams, Aug. 5, '01).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cor analoga*
3. *F. barnesiana bigbyensis*
4. *Pleurobema oviforme*
5. *Elliptio dilatatus*
6. *Alasmidonta marginata*
7. *Ellipsaria fasciolaris*
8. *Nephronaias pectorosa*
9. *Lemiox rimosus*
10. *Medionidus plateolus*
11. *Eurynia nebulosa*
12. *Lampsilis fasciola*
13. *Truncilla interrupta*

Powell River, Shawanee, Claiborne Co., Tenn.

Walker coll. (Adams, Aug. 31, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. cuneolus*
4. *F. cor analoga*
5. *F. barnesiana bigbyensis*
6. *Amblema plicata costata*
7. *Pleurobema oviforme*
8. *P. oviforme argenteum*
9. *Elliptio niger*
10. *E. dilatatus*
11. *Ellipsaria subtenta*
12. *Dromus dromas caperatus*
13. *Nephroaias ligamentina gibba*
14. *Nephronaias pectorosa*
15. *Toxolasma lividum*
16. *Medionidus plateolus*
17. *Eurynia nebulosa*
18. *Lampsilis ovata*
19. *L. ovata ventricosa*
20. *L. fasciola*
21. *Truncilla triquetra*
22. *T. interrupta*
23. *T. haysiana*
24. *T. torulosa gubernaculum*
25. *T. capsæformis*

Powell River, Bryant Shoals, Claiborne Co., Tenn.

Walker coll. (Adams, Aug. 30, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cor analoga*
3. *Amblema plicata costata*
4. *Quadrula pustulosa*
5. *Quadrula cylindrica strigillata*
6. *Plethobasus cyphyus*
7. *Lexingtonia dolabelloides conradi*
8. *Pleurobema oviforme*
9. *P. oviforme argenteum*
10. *Elliptio dilatatus*
11. *Lasmigona costata*
12. *Alasmidonta marginata*
13. *Ellipsaria fasciolaris*
14. *E. subtenta*
15. *Dromus dromas caperatus*
16. *Nephronaias ligamentina gibba*
17. *N. pectorosa*
18. *Lemiox rimosus*
19. *Medionidus plateolus*
20. *Eurynia nebulosa*
21. *Lampsilis fasciola*
22. *Truncilla interrupta*
23. *T. capsæformis*

Powell River, Combs, Claiborne Co., Tenn.

Carn. Mus. (Ortmann, Sept. 12, '13 and Sept. 13, '15).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. cuneolus*
4. *F. cor analoga*
5. *F. barnesiana bigbyensis*
6. *Amblema plicata costata*
7. *Quadrula cylindrica*
8. *Plethobasus cyphyus*
9. *Lexingtonia dolabelloides conradi*
10. *Pleurobema oviforme*
11. *P. oviforme argenteum*
12. *Elliptio dilatatus*
13. *Lasmigona costata*
14. *Alasmidonta marginata*
15. *Strophitus edentulus*
16. *Ellipsaria fasciolaris*
17. *E. subtenta*
18. *Dromus droma caperatus*
20. *Nephronaias pectorosa*
19. *Nephronaias ligamentina gibba*
21. *Paraptera fragilis*
22. *Proptera alata*
23. *Lemiox rimosus*

24. *Medionidus plateolus*
25. *Eurynia fabalis*
26. *E. nebulosa*
27. *E. vanuxemensis*
28. *E. recta*
29. *Lampsilis ovata*
30. *L. ovata ventricosa*
31. *L. fasciola*
32. *Truncilla triquetra*
33. *T. interrupta*
34. *T. haysiana*
35. *T. lewisi*
36. *T. torulosa gubernaculum*
37. *T. capsæformis*

Powell River, Green's Ford, Union Co., Tenn.

Walker coll. (Adams, Aug. 23, '99).

(Adams says: Campbell Co., Walker: Claiborne Co.; the locality is, where the three counties meet, and the ford is, according to map—sheet Maynardville—rather in Union Co.)

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. cuneolus*
4. *F. barnesiana*
5. *Amblema plicata costata*
6. *Quadrula cylindrica*
7. *Elliptio niger*
8. *E. dilatatus*
9. *Lasmigona costata*
10. *Strophitus edentulus*
11. *Ellipsaria fasciolaris*
12. *E. subtenta*
13. *Toxolasma lividum*
14. *Medionidus plateolus*
15. *Eurynia fabalis*
16. *E. nebulosa*
17. *Truncilla interrupta*
18. *T. capsæformis*

Powell River, Powell River P. O., Campbell Co., Tenn.

Walker coll. (Adams, Aug. 23, '99).

1. *Amblema plicata costata*
2. *Elliptio dilatatus*
3. *Lasmigona costata*
4. *Ellipsaria subtenta*
5. *Eurynia fabalis*
6. *Truncilla triquetra*
7. *T. capsæformis*

CLINCH DRAINAGE.

North Fork Clinch River, Tazewell, Tazewell Co., Va.

Walker coll. (Adams).

1. *Alasmidonta minor*
2. *Eurynia nebulosa*

Clinch River, Tazewell, Tazewell Co., Va.

Carn. Mus. (Ortmann, Sept. 19, '12).

1. *Fusconaia barnesiana bigbyensis*
2. *Lasmigona badia*

Clinch River, Cedar Bluff, Tazewell Co., Va.

Carn, Mus. (Ortmann, Sept. 20, '12, and May 11, '13).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. barnesiana bigbyensis*
3. *Quadrula cylindrica strigillata*
4. *Lexingtonia dolabelloides conradi*
5. *Pleurobema oviforme*
6. *P. oviforme argenteum*
7. *Elliptio dilatatus*
8. *Lasmigona badia*
9. *L. costata*
10. *Alasmidonta minor*
11. *Strophitus edentulus*
12. *Ellipsaria subtenta*
13. *Medionidus plateolus*
14. *Eurynia perpurpurea*
15. *E. nebulosa*
16. *Lampsilis ovata ventricosa*
17. *L. fasciola*
18. *Truncilla capsæformis*

Clinch River, Richland, Tazewell Co., Va.

Carn. Mus. (Ortmann, Sept. 20, '12).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. barnesiana*
3. *F. barnesiana bigbyensis*
4. *Quadrula cylindrica strigillata*
5. *Lexingtonia dolabelloides conradi*
6. *Pleurobema oviforme*
7. *P. oviforme argenteum*
8. *Elliptio dilatus*
9. *Lasmigona badia*
10. *L. costata*
11. *Alasmidonta minor*
12. *A. marginata*
13. *Strophitus edentulus*
14. *Ellipsaria subtenta*
15. *Medionidus plateolus*
16. *Eurynia perpurpurea*
17. *E. nebulosa*
18. *Lampsilis ovata ventricosa*
19. *L. fasciola*

Clinch River, Raven, Tazewell Co., Va.

Carn. Mus. (Ortmann, Sept. 21, '12).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. barnesiana bigbyensis*
3. *Quadrula cylindrica strigillata*
4. *Lexingtonia dolabelloides conradi*
5. *Pleurobema oviforme*
6. *P. oviforme argenteum*
7. *Elliptio dilatatus*
8. *Lasmigona costata*
9. *Strophitus edentulus*
10. *Ellipsaria subtenta*
11. *Medionidus plateolus*
12. *Eurynia perpurpurea*
13. *E. nebulosa*
14. *Lampsilis ovata ventricosa*
15. *L. fasciola*
16. *Truncilla haysiana*
17. *T. capsæformis*

Clinch River, Cleveland, Russell Co., Va.

* = Walker coll. (Adams, Aug., '99); † = Carn. Mus. (Ortmann, May 13, '13).

†1. *Fusconaia pilaris bursa-pastoris*
*†2. *F. cor analoga*
†3. *Amblema plicata costata*
*†4. *Quadrula intermedia*

†5. *Q. cylindrica strigillata*
*†6. *Lexingtonia dolabelloides conradi*
†7. *Pleurobema obliquum coccineum*
†8. *P. oviforme*
†9. *P. oviforme argenteum*
*†10. *Elliptio dilatatus*
*†11. *Lastena lata*
*†12. *Lasmigona costata*
†13. *Alasmidonta minor*
†14. *Alasmidonta marginata*
†15. *Strophitus edentulus*
*†16. *Ellipsaria fasciolaris*
*†17. *E. subtenta*
*†18. *Nephronaias pectorosa*
*†19. *Medionidus plateolus*
*†20. *Eurynia fabalis*
*†21. *E. perpurpurea*
†22. *E. nebulosa*
†23. *Lampsilis ovata ventricosa*
*†24. *L. fasciola*
*†25. *Truncilla capsæformis*

Clinch River, Fink, Russell Co., Va.

Carn. Mus. (Ortmann, May 12, '13).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cor analoga*
3. *F. barnesiana bigbyensis*
4. *Amblema plicata costata*
5. *Quadrula cylindrica strigillata*
6. *Pleurobema oviforme argenteum*
7. *Elliptio dilatatus*
8. *Lasmigona costata*
9. *Alasmidonta marginata*
10. *Ellipsaria fasciolaris*
11. *Nephronaias pectorosa*
12. *Medionidus plateolus*
13. *Eurynia nebulosa*
14. *Lampsilis ovata ventricosa*
15. *L. fasciola*
16. *Truncilla capsæformis*

Clinch River, St. Paul, Wise Co., Va.

* = Walker coll. (Adams, Aug. 8, '99); † = Carn. Mus. (Ortmann, May 14, '13).

†1. *Fusconaia pilaris bursa-pastoris*
†2. *F. cor analoga*
†3. *F. barnesiana bigbyensis*
*†4. *Amblema plicata costata*
†5. *Lexingtonia dolabelloides conradi*
†6. *Pleurobema oviforme argenteum*
*†7. *Elliptio dilatatus*
†8. *Lastena lata*
*†9. *Lasmigona costata*
†10. *Alasmidonta minor*
*†11. *A. marginata*
†12. *Strophitus edentulus*
*†13. *Ellipsaria fasciolaris*
*†14. *Ellipsaria subtenta*
†15. *Nephronaias ligamentina gibba*
*†16. *N. pectorosa*
†17. *Lemiox rimosus*
*†18. *Medionidus plateolus*
†19. *Eurynia fabalis*
†20. *E. perpurpurea*
*†21. *E. nebulosa*
†22. *E. recta*
†23. *Lampsilis ovata ventricosa*
*†24. *L. fasciola*
*†25. *Truncilla capsæformis*

Clinch River, Dungannon, Scott Co., Va.

Walker coll. (Adams, Aug. 11, '99).

1. *Amblema plicata costata*
2. *Truncilla torulosa gubernaculum*

Clinch River, Clinchport, Scott Co., Va.

*=Walker coll. (Adams, Aug., '99); †=Carn. Mus. (Ortmann, Sept. 8, '13).

*†1. *Fusconaia pilaris bursa-pastoris*
*†2. *F. pilaris lesueuriana*
†3. *F. cuneolus*
*†4. *F. cor analoga*
†5. *F. barnesiana bigbyensis*
*†6. *Amblema plicata costata*
*7. *Quadrula intermedia*
†8. *Q. cylindrica*
*9. *Rotundaria tuberculata*
†10. *Plethobasus cyphyus*
†11. *Lexingtonia dolabelloides conradi*
†12. *Pleurobema obliquum coccineum*
†13. *P. oviforme*
*†14. *Elliptio niger*
*†15. *E. dilatatus*
*16. *Lastena lata*
*†17. *Lasmigona costata*
*†18. *Alasmidonta marginata*
*†19. *Ellipsaria fasciolaris*
†20. *E. subtenta*
*†21. *Nephronaias ligamentina gibba*
*†22. *N. pectorosa*
*†23. *Proptera alata*
*†24. *Medionidus plateolus*
†25. *Eurynia perpurpurea*
†26. *E. nebulosa*
†27. *E. recta*
†28. *Lampsilis ovata*
*†29. *L. ovata ventricosa*
*†30. *L. fasciola*
†31. *Truncilla triquetra*
*†32. *T. interrupta*
*†33. *T. torulosa gubernaculum*
*†34. *T. capsæformis*

Clinch River, Speer's Ferry, Scott Co., Va.

Carn. Mus. (Ortmann, July 8, '13).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cuneolus*
3. *F. cor analoga*
4. *Amblema plicata costata*
5. *Quadrula cylindrica*
6. *Rotundaria tuberculata*
7. *Pleurobema oviforme argenteum*
8. *Elliptio dilatatus*
9. *Lasmigona costata*
10. *Alasmidonta minor*
11. *A. marginata*
12. *Ellipsaria fasciolaris*
13. *Nephronaias pectorosa* (seen)
14. *Toxolasma lividum*
15. *Medionidus plateolus*
16. *Eurynia fabalis*
17. *E. trabalis*
18. *E. perpurpurea*
19. *E. nebulosa*
20. *E. vanuxemensis*
21. *Lampsilis ovata ventricosa*
22. *Truncilla triquetra*
23. *T. interrupta*
24. *T. lenior*
25. *T. capsæformis*

Clinch River, Church Ford, Scott Co., Va.

Walker coll.

1. *Fusconaia cor analoga*

Clinch River, Horton Ford, Hancock Co., Tenn.

Walker coll. (Adams, Aug. 14, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cuneolus*
3. *Rotundaria tuberculata*
4. *Lasmigona costata*
5. *Nephronaias ligamentina gibba*
6. *N. pectorosa*
7. *Truncilla triquetra*
8. *T. capsæformis*

Clinch River, Kyle Ford, Hancock Co., Tenn.

Walker coll.

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. barnesiana*
4. *Pleurobema oviforme*
5. *T. oviforme argenteum*
6. *Elliptio dilatatus*
7. *Ellipsaria subtenta*
8. *Medionidus plateolus*
9. *Truncilla torulosa gubernaculum*

Clinch River, Sneedville, Hancock Co. Tenn. ("between Kyle Ford and Sneedville").

Walker coll. (Adams, Aug. 16, '99).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cor analoga*
3. *Plethobasus cyphyus*
4. *Elliptio dilatatus*
5. *Ellipsaria subtenta*

Clinch River, Oakman, Grainger Co., Tenn.

Carn. Mus. (Ortmann, May 25, '15; Sept. 14, '15).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. cuneolus*
3. *Amblema plicata costata*
4. *Rotundaria tuberculata*
5. *Plethobasus cyphyus*
6. *Pleurobema obliquum rubrum*
7. *Elliptio niger*
8. *E. dilatatus*
9. *Lastena lata*
10. *Lasmigona costata*
11. *Alasmidonta marginata*
12. *Strophitus edentulus*
13. *Ellipsaria fasciolaris*
14. *Cyprogenia stegaria*
15. *Nephronaias ligamentina gibba*
16. *Nephronaias pectorosa*
17. *Amygdalonaias truncata*
18. *Proptera alata*
19. *Medionidus plateolus*
20. *Eurynia nebulosa*
21. *E. vanuxemensis*
22. *E. recta*
23. *Lampsilis ovata*
24. *L. ovata ventricosa*
25. *L. fasciola*
26. *Truncilla triquetra*
27. *T. arcæformis*
28. *T. interrupta*
29. *T. torulosa gubernaculum*
30. *T. capsæformis*

Clinch River, Clinch River Station, Claiborne Co., Tenn.

Carn. Mus. (Ortmann, Sept. 11, '13).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris bursa-pastoris*
3. *F. cuneolus*
4. *F. cor analoga*
5. *Amblema plicata costata*
6. *Quadrula cylindrica*
7. *Rotundaria tuberculata*
8. *Plethobasus cyphyus*
9. *Lexingtonia dolabelloides conradi*
10. *Pleurobema obliquum rubrum*
11. *Elliptio niger*
12. *E. dilatatus*
13. *Lasmigona costata*
14. *Alasmidonta marginata*
15. *Strophitus edentulus*
16. *Ellipsaria fasciolaris*
17. *E. subtenta*
18. *Cyprogenia stegaria*
19. *Dromus dromas caperatus*
20. *Nephronaias ligamentina gibba*
21. *N. pectorosa*
22. *Amygdalonaias truncata*
23. *Paraptera fragilis*
24. *Proptera alata*
25. *Medionidus plateolus*
26. *Eurynia fabalis*
27. *E. nebulosa*
28. *E. recta*
29. *Lampsilis ovata*
30. *L. ovata ventricosa*
31. *L. fasciola*
32. *Truncilla triquetra*
33. *T. arcæformis*
34. *T. interrupta*
35. *T. haysiana*
36. *T. torulosa gubernaculum*
37. *T. capsæformis*

Clinch River, Black Fox Ford, Union Co., Tenn.

* = Walker coll. (Adams, Aug. 19, '99); † = Carn. Mus. (Ortmann, Sept. 15, '15).

*†1. *Fusconaia pilaris bursa-pastoris*
†2. *F. pilaris lesueuriana*
*†3. *F. cuneolus*
†4. *Amblema plicata costata*
5. *Rotundaria tuberculata* (seen)
†6. *Plethobasus cyphyus*
†7. *Pleurobema obliquum catillus*
*†8. *P. obliquum rubrum*
9. *Elliptio dilatatus* (seen)
*10. *Lasmigona costata* (seen)
*†11. *Alasmidonta marginata*
12. *Strophitus edentulus* (seen)
†13. *Ellipsaria fasciolaris*
*14. *E. subtenta*
†15. *Cyprogenia stegaria*
†16. *Nephronaias ligamentina gibba*
†17. *N. pectorosa*
*†18. *Amygdalonaias truncata*
19. *Proptera alata* (seen)
†20. *Medionidus plateolus*
†21. *Eurynia nebulosa*
22. *E. recta* (seen)
†23. *Lampsilis ovata*
*24. *L. ovata ventricosa*
†25. *L. fasciola*
*†26. *Truncilla triquetra*
*†27. *T. interrupta*
*†28. *T. haysiana*
*†29. *T. torulosa gubernaculum*
*†30. *T. capsæformis*

Clinch River, Walker's Ford, Union Co., Tenn.

Walker coll.

1. *Fusconaia barnesiana*

Clinch River, Needham Ford, Union Co., Tenn.

Walker coll. (Adams, Aug. 19, '99).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris bursa-pastoris*
3. *F. pilaris lesueuriana*
4. *F. cor*
5. *F. cor analoga*
6. *Rotundaria tuberculata*
7. *Plethobasus cyphyus*
8. *Pleurobema obliquum*
9. *P. obliquum coccineum*
10. *P. obliquum rubrum*
11. *Elliptio niger*
12. *E. dilatatus*
13. *Lasmigona costata*
14. *Alasmidonta marginata*
15. *Strophitus edentulus*
16. *Ellipsaria fasciolaris*
17. *Cyprogenia stegaria*
18. *Dromus dromas caperatus*
19. *Nephronaias ligamentina gibba*
20. *N. pectorosa*
21. *Paraptera leptodon*
22. *Proptera alata*
23. *Eurynia recta*
24. *Lampsilis ovata*
25. *L. fasciola*
26. *Truncilla interrupta*

Clinch River, Kelly Ford, Union Co., Tenn.

Walker coll. (Adams, Aug. 20, '99) ("between Kelly and Sharp's Ford").

1. *Cumberlandia monodonta*
2. *Truncilla torulosa gubernaculum*

Clinch River, below Agee, Campbell Co., Tenn.

Walker coll. (Adams, Aug. 24, '99) ("Agee to Offutt").

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris lesueuriana*
3. *Quadrula cylindrica*
4. *Rotundaria tuberculata*
5. *Plethobasus cyphyus*
6. *Lexingtonia dolabelloides*
7. *Pleurobema obliquum*
8. *P. obliquum rubrum*
9. *Elliptio niger*
10. *E. dilatatus*
11. *Ellipsaria fasciolaris*
12. *Obliquaria reflexa*
13. *Cyprogenia stegaria*
14. *Dromus dromas caperatus*
15. *Nephronaias ligamentina gibba*
16. *Eurynia recta*

Clinch River, Offutt, Anderson Co., Tenn.

Carn. Mus. (Ortmann, Sept. 1, '14).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris bursa-pastoris*
3. *F. pilaris lesueuriana*
4. *F. cuneolus appressa*
5. *Amblema plicata costata*
6. *Quadrula pustulosa*
7. *Rotundaria tuberculata*
8. *Plethobasus cyphyus*
9. *Pleurobema obliquum*
10. *P. obliquum rubrum*
11. *Elliptio niger*
12. *E. dilatatus*
13. *Lasmigona costata*
14. *Ellipsaria fasciolaris*
15. *Cyprogenia stegaria*
16. *Dromus dromas caperatus*
17. *Nephronaias ligamentina gibba*
18. *Plagiola lineolata*
19. *Proptera alata*
20. *Eurynia recta*
21. *Lampsilis ovata*
22. *L. fasciola* (seen)
23. *L. orbiculata*

Clinch River, Clinton, Anderson Co., Tenn. (Moore Ferry).

* = Walker coll. (Adams, Aug. 25, '99) ("between Offutt and Clinton"); † = Carn. Mus. (Ortmann, Sept. 7, '14); (no. 42: Hartman coll.).

1. *Cumberlandia monodonata* (seen)
*2. *Fusconaia pilaris*
*†3. *F. pilaris lesueuriana*
†4. *F. pilaris bursa-pastoris*
†5. *F. cuneolus*
*†6. *F. cuneolus appressa*
†7. *F. barnesiana*
†8. *Amblema plicata costata*
†9. *Quadrula pustulosa*
*†10. *Q. cylindrica*
*†11. *Rotundaria tuberculata*
†12. *Plethobasus cyphyus*
†13. *Lexingtonia dolabelloides*
†14. *L. dolabelloides conradi*
*†15. *Pleurobema obliquum*
†16. *P. obliquum cordatum*
*17. *P. obliquum rubrum*
†18. *P. oviforme*
*†19. *Elliptio niger*
*†20. *E. dilatatus*
†21. *Lastena lata*
*22. *Lasmigona costata* (seen)
*†23. *Alasmidonta marginata*
†24. *Strophitus edentulus*
*†25. *Ellipsaria fasciolaris*
†26. *E. subtenta*
†27. *Obliquaria reflexa*
*†28. *Cyprogenia stegaria*
†29. *Dromus dromas caperatus*
†30. *Obovaria retusa*
*†31. *Nephronaias ligamentina gibba*
*†32. *Amygdalonias truncata*
33. *Proptera alata* (seen)
†34. *Lemiox rimosus*
†35. *Eurynia vanuxemensis*
*†36. *E. recta*
*†37. *Lampsilis ovata*
†38. *L. ovata ventricosa*
†39. *L. fasciola*
*†40. *Truncilla triquetra*
†41. *T. haysiana*
†42. *T. stewardsoni* (Hartm. coll.)
†43. *T. propinqua*
†44. *T. capsæformis*

Clinch River, Edgemoor, Anderson Co., Tenn.

Carn. Mus. (Ortmann, Sept. 8, '14; Sept. 17, '15).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris*
3. *F. pilaris lesueuriana*
4. *F. pilaris bursa-pastoris*
5. *F. cor*
6. *F. barnesiana*
7. *F. barnesiana tumescens*
8. *Quadrula pustulosa*
9. *Q. cylindrica*
10. *Rotundaria tuberculata*
11. *Plethobasus cooperianus*
12. *P. cyphyus*
13. *Pleurobema obliquum*
14. *P. obliquum cordatum*
15. *P. obliquum catillus*
16. *P. obliquum rubrum*
17. *P. oviforme holstonense*
18. *Elliptio niger*
19. *E. dilatatus*
20. *Lastena lata*
21. *Lasmigona costata*
22. *Alasmidonta marginata*
23. *Strophitus edentulus*
24. *Ellipsaria fasciolaris*
25. *Obliquaria reflexa*
26. *Cyprogenia stegaria*
27. *Dromus dromas caperatus*
28. *Nephronaias ligamentina gibba*
29. *Amygdalonias truncata*
30. *Paraptera leptodon*

31. *P. fragilis*
32. *Proptera alata*
33. *Eurynia recta*
34. *Lampsilis ovata*
35. *L. ovata ventricosa*
36. *L. fasciola*
37. *Truncilla triquetra*
38. *T. interrupta*
39. *T. haysiana*
40. *T. propinqua*
41. *T. capsæformis*

Clinch River, Solway, Knox Co., Tenn.

Carn. Mus. (Ortmann, Sept. 12, '14).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris*
3. *F. pilaris lesueuriana*
4. *F. pilaris bursa-pastoris*
5. *F. cuneolus appressa*
6. *F. barnesiana bigbyensis*
7. *Amblema plicata costata*
8. *Quadrula pustulosa*
9. *Q. cylindrica* (seen)
10. *Rotundaria tuberculata*
11. *Plethobasus cyphyus*
12. *Lexingtonia dolabelloides*
13. *Pleurobema obliquum*
14. *P. obliquum cordatum*
15. *P. obliquum coccineum*
16. *P. obliquum rubrum*
17. *Elliptio niger*
18. *Elliptio dilatatus*
19. *Strophitus edentulus*
20. *Obliquaria reflexa*
21. *Cyprogenia stegaria*
22. *Dromus dromas caperatus*
23. *Nephronaias ligamentina gibba*
24. *Amygdalonaias truncata*
25. *Paraptera fragilis* (seen)
26. *Proptera alata*
27. *Eurynia nebulosa*
28. *E. recta*
29. *Lampsilis ovata*
30. *L. ovata ventricosa*
31. *L. orbiculata*
32. *Truncilla triquetra*
33. *T. haysiana*
34. *T. capsæformis*

Clinch River, Patton's Ferry, Roane Co., Tenn.

(According to Pilsbry & Rhoads.)

1. *Fusconaia pilaris*
2. *F. cor*
3. *F. barnesiana tumescens*
4. *Amblema plicata costata*
5. *Quadrula pustulosa*
6. *Plethobasus cooperianus*
7. *Pleurobema obliquum rubrum*
8. *Elliptio niger*
9. *Elliptio dilatatus*
10. *Alasmidonta marginata*
11. *Obliquaria reflexa*
12. *Nephronaias ligamentina gibba*
13. *Plagiola lineolata*
14. *Eurynia vanuxemensis*
15. *Lampsilis fasciola*
16. *Truncilla propinqua*

(Small tributaries of Clinch.)

Panther Creek, Hancock Co., Tenn. (near Sneedville, also spelled Painter Creek).

Walker coll.

1. *Strophitus edentulus*

Cove Creek, Caryville, Campbell Co., Tenn.

* = Walker coll.; † = Carn. Mus. (Ortmann, Sept. 12, '15).

†1. *Fusconaia barnesiana*
†2. *F. barnesiana bigbyensis*
*†3. *Lasmigona badia*
†4. *Medionidus plateolus*
†5. *Eurynia nebulosa*
†6. *E. vanuxemensis*

Coal Creek, Anderson Co., Tenn.

* = Walker coll.; ‡ = reported by Call.

*‡1. *Fusconaia barnesiana*
*2. *Lampsilis virescens*

Cane Creek, Offutt, Anderson Co., Tenn.

(Ortmann, Sept. 1, '14).

1. *Eurynia vanuxemensis* (seen)

Bull Run, Heiskell, Knox Co., Tenn.

Walker coll.

1. *Lasmigona badia*

(DRAINAGE OF POPLAR CREEK.)

Brush Fork, Marlow, Anderson Co., Tenn.

Carn. Mus. (Ortmann, Sept. 2, '14).

1. *Alasmidonta minor*
2. *Eurynia nebulosa*
3. *Eurynia vanuxemensis*

Poplar Creek, Roane Co., Tenn.

* = Walker coll.; ‡ = reported by Call.

*1. *Fusconaia cuneolus*
*‡2. *F. cuneolus appressa*
*3. *F. cor*
*4. *Amblema plicata costata*
*5. *Pleurobema oviforme*

Emory River, Harriman Junction, Roane Co., Tenn.

Carn. Mus. (Ortmann, May 15, '15).

1. *Elliptio niger*
2. *Eurynia nebulosa*

Emory River, Harriman, Roane Co., Tenn.

‡ = according to Pilsbry & Rhoads; † = Carn. Mus. (Ortmann, May 16, '15).

‡†1. *Fusconaia cuneolus*
‡2. *F. barnesiana tumescens*
†3. *Amblema plicata costata*
†4. *Pleurobema oviforme*
‡5. *P. oviforme holstonense*
6. *Elliptio niger* (seen)
‡†7. *E. dilatatus*
8. *Lasmigona costata* (seen)
‡†9. *Ellipsaria fasciolaris*
‡†10. *Toxolasma lividum*
‡11. *Medionidus plateolus*
†12. *Eurynia perpurpurea*
†13. *E. nebulosa*
‡14. *E. vanuxemensis*
†15. *Lampsilis virescens*
†16. *L. ovata ventricosa*
‡17. *L. fasciola*
†18. *Truncilla turgidula*

HOLSTON DRAINAGE.

(HEADWATERS.)

Little Mocassin Creek, Gate City, Scott Co., Va.

Carn. Mus. (Ortmann, May 16, '13).

1. *Lasmigona badia*
2. *Eurynia vanuxemensis*

Big Mocassin Creek, Willow Spring, Russell Co., Va.

Walker coll.

1. *Fusconaia barnesiana bigbyensis*
2. *Pleurobema oviforme argenteum*

Big Mocassin Creek, Mocassin Gap, Scott Co., Va.

Carn. Mus. (Ortmann, May 16, '13; Sept. 9, '15).

1. *Fusconaia cuneolus*
2. *F. barnesiana*
3. *F. barnesiana bigbyensis*
4. *Quadrula cylindrica*
5. *Pleurobema oviforme argenteum*
6. *Alasmidonta minor*
7. *A. marginata*
8. *Pegias fabula*
9. *Ellipsaria subtenta*
10. *Medionidus plateolus*
11. *Eurynia nebulosa*
12. *E. vanuxemensis*
13. *Lampsilis ovata ventricosa*
14. *L. fasciola*
15. *Truncilla capsæformis*

North Fork Holston River, Saltville, Smyth Co., Va.

† = Carn. Mus. (Ortmann, Sept. 17, '12); * = Carn. Mus. (O. A. Peterson, June 20, '17).

†*1. *Fusconaia barnesiana bigbyensis*
†*2. *Lexingtonia dolabelloides conradi*
†*3. *Pleurobema oviforme argenteum*
†4. *Lasmigona costata*
†5. *Alasmidonta minor*

†6. *A. marginata*
†*7. *Pegias fabula*
†8. *Strophitus edentulus*
†*9. *Ellipsaria subtenta*
†10. *Nephronaias pectorosa*
*11. *Toxolasma lividum*
†*12. *Medionidus plateolus*
†*13. *Eurynia nebulosa*
†*14. *E. vanuxemensis*
†15. *Lampsilis ovata ventricosa*
†16. *L. fasciola*

North Fork Holston River, Holston, Washington Co., Va.

Walker coll. (Adams, Aug. 13, '01).

1. *Fusconaia cor analoga*
2. *F. barnesiana*
3. *F. barnesiana bigbyensis*
4. *Lexingtonia dolabelloides conradi*
5. *Pleurobema oviforme argenteum*
6. *Elliptio dilatatus*
7. *Lasmigona costata*
8. *Pegias fabula*
9. *Ellipsaria subtenta*
10. *Nephronaias pectorosa*
11. *Toxolasma lividum*
12. *Lemiox rimosus*
13. *Medionidus plateolus*
14. *Eurynia nebulosa*
15. *Lampsilis fasciola*

North Fork Holston River, Mendota, Washington Co., Va.

* = Walker coll. (Adams, Oct. 13, '00); † = Carn. Mus. (Ortmann, July 5, '13).

†1. *Fusconaia pilaris bursa-pastoris*
†2. *F. cuneolus*
*†3. *F. cor analoga*
†4. *F. barnesiana*
†5. *F. barnesiana bigbyensis*
†6. *Quadrula intermedia*
†7. *Q. cylindrica strigillata*
8. *Rotundaria tuberculata*
*†9. *Lexingtonia dolabelloides conradi*
†10. *Pleurobema oviforme*
†11. *P. oviforme argenteum*
*†12. *Elliptio dilatatus*
†13. *Lasmigona costata*
†14. *Alasmidonta marginata*
†15. *Pegias fabula*
†16. *Ellipsaria fasciolaris*
*†17. *E. subtenta*
†18. *Nephronaias pectorosa*
*19. *Medionidus plateolus*
†20. *Eurynia perpurpurea*
*†21. *E. nebulosa*
†22. *E. vanuxemensis*
†23. *Lampsilis ovata ventricosa*
†24. *L. fasciola*
†25. *Truncilla triquetra*
*26. *T. capsæformis*

North Fork Holston River, Hilton, Scott Co., Va.

Carn. Mus. (Ortmann, July 7, '13).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. cuneolus*
4. *F. cor analoga*
5. *Amblema plicata costata*
6. *Quadrula cylindrica strigillata*
7. *Rotundaria tuberculata*
8. *Lexingtonia dolabelloides conradi*
9. *Pleurobema oviforme*
10. *P. oviforme argenteum*
11. *Elliptio dilatatus*

12. *Lasmigona costata*
13. *Alasmidonta marginata*
14. *Strophitus edentulus*
15. *Ellipsaria fasciolaris*
16. *Nephronaias pectorosa*
17. *Lemiox rimosus*
18. *Medionidus plateolus*
19. *Eurynia fabalis*
20. *E. perpurpurea*
21. *E. nebulosa*
22. *E. vanuxemensis*
23. *Lampsilis ovata ventricosa*
24. *L. fasciola*
25. *Truncilla triquetra*
26. *T. interrupta*
27. *T. haysiana*
28. *T. capsæformis*

North Fork Holston River, Holston Bridge, Scott Co., Va.

Walker coll. (Adams, Aug. 11, '01).

1. *Fusconaia pilaris lesueuriana*
2. *F. cor analoga*
3. *F. barnesiana bigbyensis*
4. *Quadrula cylindrica strigillata*
5. *Elliptio dilatatus*
6. *Lasmigona costata*
7. *Ellipsaria subtenta*
8. *Nephronaias ligamentina gibba*
9. *Nephronaias pectorosa*
10. *Toxolasma lividum*
11. *Eurynia vanuxemensis*
12. *Lampsilis fasciola*
13. *Truncilla triquetra*
14. *T. interrupta*
15. *T. torulosa gubernaculum*
16. *T. capsæformis*

North Fork Holston River, Rotherwood, Hawkins Co., Tenn.

Carn. Mus. (Ortmann, July 13, '13; Sept. 5, '13).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. cuneolus*
4. *F. cor analoga*
5. *F. barnesiana*
6. *F. barnesiana bigbyensis*
7. *Amblema plicata costata*
8. *Quadrula cylindrica strigillata*
9. *Rotundaria tuberculata*
10. *Plethobasus cyphyus*
11. *Lexingtonia dolabelloides conradi*
12. *Pleurobema oviforme*
13. *P. oviforme argenteum*
14. *Elliptio dilatatus*
15. *Lasmigona costata*
16. *Alasmidonta marginata*
17. *Strophitus edentulus*
18. *Ellipsaria fasciolaris*
19. *Ellipsaria subtenta*
20. *Nephronaias ligamentina gibba*
21. *N. pectorosa*
22. *Proptera alata* (seen)
23. *Lemiox rimosus*
24. *Medionidus plateolus*
25. *Eurynia fabalis*
26. *E. perpurpurea*
27. *E. nebulosa*
28. *E. vanuxemensis*
29. *E. recta*
30. *Lampsilis ovata ventricosa*
31. *L. fasciola*
32. *Truncilla triquetra*
33. *T. interrupta*
34. *T. lenior*
35. *T. haysiana*
36. *T. torulosa gubernaculum*
37. *T. capsæformis*

Middle Fork Holston River, Marion, Smyth Co., Va.

Carn. Mus. (Ortmann, Sept. 16, '12).

1. *Eurynia nebulosa*
2. *Eurynia vanuxemensis*

Middle Fork Holston River, Chilhowie, Smyth Co., Va.

Carn. Mus. (Ortmann, May 20, '13).

1. *Fusconaia barnesiana bigbyensis*
2. *Pleurobema oviforme argenteum*
3. *Elliptio dilatatus*
4. *Lasmigona costata*
5. *Alasmidonta minor*
6. *A. marginata*
7. *Ellipsaria subtenta*
8. *Medionidus plateolus*
9. *Eurynia nebulosa*
10. *E. vanuxemensis*
11. *Lampsilis fasciola*
12. *Truncilla walkeri*

Laurel Creek, Mock's Mill (near Vestal P. O.), Washington Co., Va.

Walker coll. (Adams, Aug. 26, '01).

1. *Fusconaia barnesiana bigbyensis*

South Fork Holston River, Barron, Washington Co., Va.

* = Walker coll. (Adams, Aug. 14, '01); † = Carn. Mus. (Ortmann, May 19, '13).

†1. *Fusconaia barnesiana bigbyensis*
†2. *Pleurobema oviforme argenteum*
*3. *Elliptio dilatatus*
*4. *Lasmigona costata*
†5. *Alasmidonta minor*
*6. *A. marginata*
*7. *Ellipsaria subtenta*
*8. *Nephronaias pectorosa*
*†9. *Medionidus plateolus*
*†10. *Eurynia nebulosa*
*†11. *E. vanuxemensis*
*†12. *Lampsilis fasciola*
*†13. *Truncilla walkeri*

South Fork Holston River, Fish Dam, Sullivan Co., Tenn.

Walker coll. (Adams, Sept. 6, '01).

1. *Lexingtonia dolabelloides conradi*
2. *Elliptio dilatatus*
3. *Nephronaias pectorosa*
4. *Eurynia nebulosa*
5. *E. vanuxemensis*
6. *Lampsilis fasciola*

South Fork Holston River, Emmett, Sullivan Co., Tenn.

Carn. Mus. (Ortmann, July 9, '13).

1. *Fusconaia barnesiana bigbyensis*
2. *Lexingtonia dolabelloides conradi*
3. *Pleurobema oviforme*
4. *P. oviforme argenteum*
5. *Elliptio dilatatus*
6. *Lasmigona costata*
7. *Alasmidonta marginata*
8. *Ellipsaria fasciolaris*
9. *Ellipsaria subtenta*
10. *Nephronaias pectorosa*
11. *Eurynia nebulosa*
12. *E. vanuxemensis*
13. *Lampsilis ovata ventricosa*
14. *L. fasciola*
15. *Truncilla walkeri*

South Fork Holston, Bluff City, Sullivan Co., Tenn.

Carn. Mus. (Ortmann, July 10, '13).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. barnesiana*
4. *F. barnesiana bibgyensis*
5. *Quadrula intermedia*
6. *Lexingtonia dolabelloides conradi*
7. *Pleurobema oviforme argenteum*
8. *Elliptio dilatatus*
9. *Lasmigona badia*
10. *Lasmigona costata*
11. *Alasmidonta marginata*
12. *Strophitus edentulus*
13. *Ellipsaria fasciolaris*
14. *E. subtenta* (seen)
15. *Nephronaias pectorosa*
16. *Eurynia nebulosa*
17. *E. vanuxemensis*
18. *Lampsilis ovata ventricosa*
19. *L. fasciola*

Beaver Creek, Bristol, Washington Co., Va.

Carn. Mus. (Ortmann, July 6, '13).

1. *Alasmidonta minor*
2. *Medionidus plateolus*

South Fork Holston River, Pactolus, Sullivan Co., Tenn.

Carn. Mus. (Ortmann, May 20, '14).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *F. barnesiana*
4. *Amblema plicata costata*
5. *Quadrula intermedia*
6. *Q. cylindrica strigillata*
7. *Rotundaria tuberculata*
8. *Pleurobema oviforme*
9. *P. oviforme argenteum*
10. *Elliptio niger*
11. *E. dilatatus*
12. *Lasmigona costata*
13. *Alasmidonta marginata*
14. *Pegias fabula*
15. *Strophitus edentulus*
16. *Ellipsaria fasciolaris*
17. *E. subtenta*
18. *Nephronaias ligamentina gibba*
19. *N. pectorosa*
20. *Medionidus plateolus*
21. *Eurynia fabalis*
22. *Lampsilis ovata ventricosa*
23. *L. fasciola*
24. *Truncilla triquetra*
25. *T. lenior*
26. *T. haysiana*
27. *T. torulosa gubernaculum*
28. *T. capsæformis*

Watauga River, Watauga, Carter Co., Tenn.

‡ = according to Pilsbry & Rhoads; † = Carn. Mus. (Ortmann, July 14, '13).

†1. *Fusconaia pilaris bursa-pastoris*
‡†2. *F. barnesiana bigbyensis*
†3. *Pleurobema oviforme argenteum*
†4. *Lasmigona badia*
‡5. *Nephronaias pectorosa*
†6. *Eurynia nebulosa*
†7. *E. vanuxemensis*
†8. *Lampsilis fasciola*

Watauga River, Johnson City, Washington Co., Tenn.

According to Pilsbry & Rhoads.

1. *Fusconaia pilaris bursa-pastoris*
2. *Elliptio dilatatus*
3. *Lasmigona costata*
4. *Alasmidonta marginata*
5. *Strophitus edentulus*
6. *Medionidus plateolus*
7. *Eurynia nebulosa*
8. *E. vanuxemensis*
9. *Lampsilis fasciola*

(HOLSTON PROPER.)

Holston River, Church Hill, Hawkins Co., Tenn.

Carn. Mus. (Ortmann, Aug. 25, '14).

1. *Fusconaia pilaris bursa-pastoris*
2. *F. pilaris lesueuriana*
3. *Amblema plicata costata* (seen)
4. *Quadrula intermedia* (seen)
5. *Q. cylindrica*
6. *Rotundaria tuberculata*
7. *Elliptio niger* (seen)
8. *E. dilatatus*
9. *Lasmigona badia*
10. *L. costata*
11. *Nephronaias ligamentina gibba*
12. *Proptera alata* (seen)
13. *Eurynia fabalis*
14. *Truncilla lenior*
15. *T. haysiana*
16. *T. capsæformis*

Holston River, Austin Mill, Hawkins Co., Tenn.

* = Walker coll. ("Rogersville," practically the same locality); † = Carn. Mus. (Ortmann, Aug. 24, '14).

1. *Cumberlandia monodonta* (seen)
2. *Fusconaia pilaris lesueuriana* (seen)
†3. *F. cuneolus*
†4. *F. cuneolus appressa*
†5. *F. barnesiana*
†6. *Amblema plicata costata*
†7. *Quadrula cylindrica*
†8. *Rotundaria tuberculata*
†9. *Pleurobema obliquum rubrum*
†10. *Elliptio niger*
†11. *E. dilatatus*
†12. *Lasmigona costata*
†13. *Alasmidonta marginata*
†14. *Ellipsaria fasciolaris*
†15. *Nephronaias ligamentina gibba*
†16. *N. pectorosa*
*17. *Toxolasma lividum*
*18. *Lemiox rimosus*
†19. *Eurynia nebulosa*
†20. *Lampsilis ovata ventricosa*
†21. *Truncilla triquetra*
†22. *T. arcæformis*
*†23. *T. haysiana*
*24. *T. torulosa gubernaculum*
*†25. *T. turgidula*
*†26. *T. capsæformis*

Holston River, Holston Station, Grainger Co., Tenn.

*=Walker coll. (Adams); †=Carn. Mus. (Ortmann, Sept. 15, '13).

†1. *Fusconaia pilaris lesueuriana*
†2. *F. cuneolus*
†3. *F. barnesiana*
*4. *Rotundaria tuberculata* (seen)
†5. *Plethobatus cyphyus*
†6. *Pleurobema obliquum*
†7. *P. obliquum cordatum*
†8. *P. obliquum rubrum*
†9. *P. oviforme*
*10. *Elliptio niger*
†11. *E. dilatatus*
†12. *Lasmigona costata*
†13. *Alasmidonta marginata*
†14. *Strophitus edentulus*
†15. *Ellipsaria fasciolaris*
†16. *E. subtenta*
*†17. *Dromus dromas caperatus*
†18. *Obovaria subrotunda levigata*
†19. *Nephronaias ligamentina gibba*
*†20. *Nephronaias pectorosa*
†21. *Paraptera leptodon*
†22. *P. fragilis*
†23. *Proptera alata*
†24. *Medionidus plateolus*
†25. *Eurynia recta*
†26. *Lampsilis ovata*
†27. *L. ovata ventricosa*
†28. *L. fasciola*
†29. *Truncilla triquetra*
†30. *T. arcæformis*
†31. *T. interrupta*
†32. *T. haysiana*
†33. *T. stewardsoni*
†34. *T. lewisi*
†35. *T. turgidula*
†36. *T. florentina*
†37. *T. capsæformis*

Holston River, Noeton, Grainger Co., Tenn.

Carn. Mus. (Ortmann, May 22, '14).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris*
3. *F. pilaris lesueuriana*
4. *F. cuneolus*
5. *F. cuneolus appressa*
6. *F. barnesiana*
7. *F. barnesiana tumescens*
8. *Amblema plicata costata*
9. *Quadrula cylindrica*
10. *Rotundaria tuberculata*
11. *Pleurobema obliquum*
12. *P. obliquum catillus*
13. *P. obliquum coccineum*
14. *P. obliquum rubrum*
15. *P. oviforme*
16. *Elliptio niger*
17. *E. dilatatus*
18. *Lasmigona costata*
19. *Strophitus edentulus*
20. *Ellipsaria fasciolaris*
21. *E. subtenta*
22. *Dromus dromas caperatus*
23. *Nephronaias ligamentina gibba*
24. *Paraptera leptodon*
25. *P. fragilis*
26. *Proptera alata*
27. *Eurynia fabalis*
28. *E. nebulosa*
29. *E. recta*
30. *Lampsilis ovata ventricosa*
31. *Truncilla arcæformis*
32. *T. haysiana*
33. *T. turgidula*
34. *T. capsæformis*

Holston River, Turley Mill, Grainger Co., Tenn.

Carn. Mus. (Ortmann, May 23, '14).

1. *Fusconaia pilaris*
2. *F. pilaris lesueuriana*
3. *F. pilaris bursa-pastoris*
4. *F. cuneolus*
5. *F. barnesiana tumescens*
6. *Amblema plicata costata*
7. *Quadrula cylindrica*
8. *Rotundaria tuberculata*
9. *Pleurobema obliquum rubrum*
10. *P. oviforme*
11. *Elliptio niger* (seen)
12. *E. dilatatus*
13. *Lasmigona costata*
14. *Alasmidonta marginata*
15. *Strophitus edentulus*
16. *Ellipsaria fasciolaris*
17. *Cyprogenia stegaria*
18. *Dromus dromas caperatus*
19. *Nephronaias ligamentina gibba*
20. *N. pectorosa*
21. *Paraptera fragilis*
22. *Proptera alata*
23. *Lemiox rimosus*
24. *Eurynia nebulosa*
25. *E. recta*
26. *Lampsilis ovata*
27. *L. ovata ventricosa*
28. *L. fasciola*
29. *Truncilla triquetra*
30. *T. arcæformis*
31. *T. interrupta*
32. *T. haysiana*
33. *T. turgidula*
34. *T. florentina*
35. *T. capsæformis*

Holston River, McBee Ford, Hodges, Jefferson Co., Tenn.

Carn. Mus. (Ortmann, May 25, '14).

1. *Cumberlandia monodonta* (seen)
2. *Fusconaia pilaris lesueuriana*
3. *F. barnesiana*
4. *F. barnesiana tumescens*
5. *Amblema plicata costata*
6. *Quadrula pustulosa*
7. *Q. cylindrica*
8. *Rotundaria tuberculata*
9. *Plethobasus cyphyus*
10. *Pleurobema obliquum*
11. *P. obliquum cordatum*
12. *P. obliquum coccineum*
13. *P. obliquum rubrum*
14. *P. oviforme*
15. *Elliptio niger*
16. *E. dilatatus*
17. *Lasmigona costata*
18. *Alasmidonta marginata*
19. *Strophitus edentulus*
20. *Ellipsaria fasciolaris* (seen)
21. *E. subtenta* (seen)
22. *Cyprogenia stegaria*
23. *Dromus dromas caperatus*
24. *Nephronaias ligamentina gibba*
25. *Amygdalonaias truncata*
26. *Paraptera fragilis*
27. *Proptera alata*
28. *Eurynia recta*
29. *Lampsilis ovata*
30. *L. ovata ventricosa*
31. *Truncilla arcæformis*
32. *T. interrupta*
33. *T. haysiana*
34. *T. torulosa gubernaculum*
35. *T. turgidula*
36. *T. capsæformis*

Holston River, Gant Island, near Strawberry Plains, Jefferson Co., Tenn.

Walker coll. (Adams, Sept. 29, '00).

1. *Truncilla arcæformis*

Holston River, Mascot, Knox Co., Tenn.

Carn. Mus. (Ortmann, Sept. 6, '14; Sept. 16, '15).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris*
3. *F. pilaris lesueuriana*
4. *F. barnesiana*
5. *Amblema plicata costata* (seen)
6. *Quadrula pustulosa*
7. *Q. metanevra*
8. *Q. cylindrica*
9. *Rotundaria tuberculata*
10. *Plethobasus cyphyus*
11. *Pleurobema obliquum*
12. *P. obliquum cordatum*
13. *P. obliquum rubrum*
14. *P. oviforme*
15. *P. oviforme holstonense*
16. *Elliptio niger*
17. *E. dilatatus*
18. *Lasmigona costata*
19. *Alasmidonta marginata*
20. *Strophitus edentulus*
21. *Ellipsaria fasciolaris*
22. *E. subtenta*
23. *Cyprogenia stegaria*
24. *Dromus dromas caperatus*
25. *Obovaria surotunda*
26. *O. subrotunda levigata*
27. *Nephronaias ligamentina gibba*
28. *N. pectorosa* (seen)
29. *Paraptera fragilis*
30. *Proptera alata*
31. *Lemiox rimosus*
32. *Medionidus plateolus*
33. *Eurynia fabalis*
34. *E. recta*
35. *Lampsilis ovata*
36. *L. ovata ventricosa*
37. *L. fasciola*
38. *Truncilla triquetra*
39. *T. arcæformis*
40. *T. interrupta*
41. *T. haysiana*
42. *T. stewardsoni*
43. *T. torulosa gubernaculum*
44. *T. turgidula*
45. *T. florentina*
46. *T. capsæformis*

Holston River, McMillan, Knox Co., Tenn.

Carn. Mus. (Ortmann, Sept. 16, '13).

1. *Cumberlandia monodonta*
2. *Fusconaia pilaris lesueuriana*
3. *Quadrula pustulosa*
4. *Q. cylindrica*
5. *Rotundaria tuberculata*
6. *Plethobasus cyphyus*
7. *Pleurobema obliquum rubrum*
8. *Elliptio niger*
9. *E. dilatatus*
10. *Strophitus edentulus*
11. *Dromus dromas caperatus*
12. *Nephronaias ligamentina gibba*
13. *N. pectorosa*
14. *Proptera alata*
15. *Eurynia nebulosa*
16. *E. recta*
17. *Lampsilis ovata*
18. *L. ovata ventricosa*
19. *L. fasciola*
20. *Truncilla triquetra*
21. *T. arcæformis*
22. *T. interrupta*
23. *T. stewardsoni*
24. *T. florentina*
25. *T. capsæformis*

Holston River, Boyd Island, Knoxville, Knox Co., Tenn.

According to Pilsbry & Rhoads ("1 mile above junction with French Broad").

1. *Fusconaia pilaris*
2. *Quadrula pustulosa*
3. *Q. cylindrica*
4. *Rotundaria tuberculata*
5. *Pleurobema obliquum*
6. *P. obliquum rubrum*
7. *P. oviforme holstonense*
8. *Elliptio niger*
9. *E. dilatatus*
10. *Cyprogenia stegaria*
11. *Dromus dromas*
12. *Nephronaias ligamentina gibba*
13. *Paraptera fragilis*
14. *Eurynia recta*
15. *Lampsilis ovata*
16. *Truncilla arcæformis*
17. *T. propinqua*

(SMALL TRIBUTARIES OF HOLSTON PROPER.)

Big Creek, Rogersville, Hawkins Co., Tenn.

Walker coll.

1. *Lasmigona badia*
2. *Alamidonta minor*
3. *Medionidus plateolus*

Big Flat Creek, Corryton, Knox Co., Tenn.

Carn. Mus. (Ortmann, May 12, '14).

1. *Fusconaia barnesiana*
2. *Lasmigona badia*
3. *Eurynia nebulosa*
4. *E. vanuxemensis* (seen)

NOLICHUCKY RIVER DRAINAGE.

Whitehorn Creek, Bulls Gap, Hawkins Co., Tenn.

Carn. Mus. (Ortmann, May 18, '14).

1. *Lasmigona badia*
2. *Eurynia nebulosa*
3. *Eurynia vanuxemensis*

Bent Creek, Whitesburg, Hamblen Co., Tenn.

Carn. Mus. (Ortmann, Sept. 8, '15).

1. *Lasmigona badia*
2. *Eurynia nebulosa* (seen)
3. *Eurynia vanuxemensis*

Nolichucky River, Chunn's Shoals, Hamblen Co., Tenn.

Carn. Mus. (Ortmann, Sept. 17, '13) (within a mile from confluence with French Broad).

1. *Fusconaia cuneolus appressa*
2. *Amblema plicata costata*
3. *Quadrula pustulosa*
4. *Rotundaria tuberculata*
5. *Elliptio niger*
6. *Nephronaias ligamentina gibba*
7. *N. pectorosa*
8. *Paraptera fragilis*
9. *Proptera alata*
10. *Eurynia recta*
11. *Lampsilis ovata ventricosa*
12. *Truncilla triquetra*
13. *T. torulosa gubernaculum*
14. *T. capsæformis*

FRENCH BROAD RIVER DRAINAGE.

French Broad River, Asheville, Buncombe Co., N. Car.

* = Walker coll. (Mrs. Andrews); ‡ = reported by Call.

The French Broad at Asheville is now polluted by lumber industries on Davidson River; repeated attempts on my part (May 13, '14, Sept. 14, '14, May 10, '15) failed to reveal any signs of the presence of shells.

*1. *Pleurobema oviforme* (*raveneliANUM*) (also Lea)
*2. *Elliptio dilatatus*
*3. *Alasmidonta raveneliana* (also Lea)
‡4. *Ellipsaria fasciolaris*
*‡5. *Medionidus plateolus*
*‡6. *Eurynia nebulosa*
*‡7. *Lampsilis fasciola*
‡8. *Truncilla capsæformis*

Call also gives: *Fusconaia pilaris* and *F. pilaris lesueuriana*, but I have seen no specimens of these from this locality, and these records appear to me as very doubtful.

French Broad River, Hot Springs, Madison Co., N. Car.

According to Conrad, from "Warm Springs."

1. *Toxolasma lividum*

French Broad River, Boyd Creek, Sevier Co., Tenn.

Carn. Mus. (Ortmann, Sept. 10, '14).

1. *Fusconaia pilaris*
2. *F. pilaris lesueuriana*
3. *F. barnesiana*
4. *F. barnesiana tumescens*
5. *Amblema plicata costata*
6. *Quadrula pustulosa*
7. *Rotundaria tuberculata*
8. *Plethobasus cooperianus*
9. *P. cyphyus*
10. *P. cyphyus compertus*
11. *Lexingtonia dolabelloides*
12. *Pleurobema obliquum*
13. *P. obliquum cordatum*
14. *Pleurobema obliquum rubrum*

15. *P. oviforme*
16. *P. oviforme holstonense*
17. *Elliptio niger*
18. *E. dilatatus*
19. *Strophitus edentulus*
20. *Ellipsaria fasciolaris*
21. *Nephronaias ligamentina gibba*
22. *Proptera alata*
23. *Eurynia recta*
24. *Truncilla arcæformis*

(Tributaries of French Broad.)

Long Creek, near Bridgeport, Cocke Co., Tenn.

*=Walker coll.; ‡=reported by Lea.

*1. *Lasmigona badia*

‡2. *Eurynia vanuxemensis*

Big Pigeon River, Canton, Haywood Co., N. Car.

Carn. Mus. (Ortmann, May 14, '14).

1. *Alasmidonta raveneliana*
2. *Lampsilis fasciola*

Little Pigeon River, Sevierville, Sevier Co., Tenn.

Carn. Mus. (Ortmann, Aug. 31, '14).

1. *Fusconaia barnesiana*
2. *F. barnesiana bigbyensis*
3. *Pleurobema oviforme*
4. *P. oviforme argenteum*
5. *Elliptio dilatatus*
6. *Lasmigona badia*
7. *Alasmidonta minor*
8. *Toxolasma lividum*
9. *Eurynia nebulosa*
10. *E. vanuxemensis*
11. *Lampsilis ovata ventricosa*
12. *L. fasciola*
13. *Truncilla capsæformis*

Boyd Creek, Boyd Creek, Sevier Co., Tenn.

Carn. Mus. (Ortmann, Sept. 5, '14).

1. *Fusconaia barnesiana*
2. *Amblema plicata costata*
3. *Rotundaria tuberculata*
4. *Elliptio dilatatus*
5. *Lasmigona costata*
6. *Alasmidonta minor*
7. *Eurynia vanuxemensis*

Pond, draining to French Broad, eight miles above Knoxville, Knox Co., Tenn.

Walker coll. (M. D. Barber).

1. *Anodonta grandis gigantea*

Tributaries of Tennessee, below Knoxville.

(From the West.)

First Creek, Knoxville, Knox Co., Tenn.

Walker coll.

1. *Lasmigona badia*

Second Creek, Knoxville, Knox Co., Tenn.

According to Lea.

1. *Fusconaia barnesiana bigbyensis*

Third Creek, Knoxville, Knox Co., Tenn.

Walker coll.

1. *Lasmigona badia*

Piney River, Spring City, Rhea Co., Tenn.

Carn. Mus. (Ortmann, May 18, '15).

1. *Lasmigona badia*
2. *Eurynia vanuxemensis*

Martin Branch of Sale Creek, Rhea Co., Tenn.

Walker coll. (W. A. Marsh). (There is no "Martin Branch" on map; Sale Creek flows from near Dayton, Rhea Co., south into Hamilton Co., and to the Tennessee.)

1. *Fusconaia barnesiana*
2. *F. barnesiana bigbyensis*

(From the East, Coming from the Mountains.)

Little River Drainage.

Little River, Walland, Blount Co., Tenn.

Carn. Mus. (Ortmann, May 12, '15).

1. *Fusconaia barnesiana bigbyensis*
2. *Pleurobema oviforme argenteum*
3. *Medionidus plateolus*
4. *Eurynia nebulosa*
5. *E. vanuxemensis*

Little River, Melrose, Blount Co., Tenn.

Carn. Mus. (Ortmann, Sept. 11, '15).

1. *Fusconaia barnesiana bigbyensis*
2. *Pleurobema oviforme argenteum*
3. *Alasmidonta minor*
4. *Nephronaias pectorosa*
5. *Medionidus plateolus*
6. *Eurynia nebulosa*
7. *E. vanuxemensis*
8. *Lampsilis ovata ventricosa*
9. *L. fasciola*

Little River, Rockford, Blount Co., Tenn.

Carn. Mus. (Ortmann, Sept. 4, '14).

1. *Eurynia nebulosa*

Little River, Knox Co., Tenn. (lower part).

* = Walker coll.; † = Carn. Mus. (Smith coll.).

*1. *Cumberlandia monodonta*
†2. *Amblema plicata costata*
*3. *Truncilla triquetra*

Pistol Creek, Rockford, Blount Co., Tenn.

Carn. Mus. (Ortmann, Sept. 4, '14).

1. *Fusconaia cuneolus appressa*
2. *F. barnesiana*
3. *Alasmidonta minor*
4. *Toxolasma lividum*
5. *Eurynia nebulosa*

LITTLE TENNESSEE RIVER DRAINAGE.

Abram Creek, Blount Co., Tenn.

Walker coll.

1. *Fusconaia barnesiana bigbyensis*

Tellico River, Monroe Co., Tenn.

Walker coll., also reported by Lea.

1. *Fusconaia barnesiana*
2. *F. barnesiana bigbyensis*

Little Tennessee River, Monroe Co., Tenn.

* = Walker coll.; ‡ = according to Marsh.

‡1. *Fusconaia pilaris*
*2. *F. barnesiana tumescens*
*3. *Pleurobema oviforme*
*4. *P. oviforme holstonense*
*5. *Elliptio dilatatus*
*6. *Lampsilis fasciola*

Little Tennessee River, Coytee, Loudon Co., Tenn.

Walker coll. (Adams).

1. *Fusconaia pilaris*
2. *Lampsilis ovata*
3. *Truncilla haysiana*
4. *T. capsæformis*

HIWASSEE RIVER DRAINAGE.

Spring Creek, Austral, Polk Co., Tenn.

Carn. Mus. (Ortmann, May 23, '15).

1. *Fusconaia barnesiana bigbyensis*
2. *Eurynia nebulosa*
3. *Eurynia vanuxemensis*

Cane Creek, McMinn Co., Tenn.

Walker coll. ("Cane Creek, Monroe Co.;" this is near Etowah, McMinn Co.).

1. *Fusconaia barnesiana*
2. *F. barnesiana bigbyensis*
3. *Pleurobema oviforme*

Conasauga Creek, Monroe Co., Tenn.

* = Walker coll.; ‡ = according to Lewis.

*1. *Pleurobema oviforme*
*‡2. *P. oviforme argenteum* (also Lea)
*3. *Lasmigona badia*
*‡4. *Alasmidonta minor*
‡5. *Eurynia nebulosa*

Ocoee River, Ducktown, Polk Co., Tenn.

Walker coll.

1. *Alasmidonta marginata*

Hiwassee River, Austral, Polk Co., Tenn.

Carn Mus. (Ortmann, Sept. 19, '15).

1. *Fusconaia barnesiana*
2. *F. barnesiana tumescens*
3. *Pleurobema oviforme*
4. *P. oviforme holstonense*
5. *Lasmigona badia*
6. *Eurynia trabalis*

Hiwassee River, Kincannon Ferry, Meigs Co., Tenn.

Walker coll. (Adams, Oct. 9, '01).

1. *Elliptio niger*

Hiwassee River, Meigs Co., Tenn.

Walker coll. (Adams).

1. *Quadrula verrucosa*
2. *Lampsilis fasciola*

South Chickamauga Creek, Ringgold, Catoosa Co., Ga.

* = Walker coll. (Adams, Oct. 21, '01); † = Carn. Mus. (Ortmann, May 20, '15).

*†1. *Pleurobema oviforme argenteum*
†2. *Elliptio dilatatus*
†3. *Lasmigona badia*
†4. *L. costata*
†5. *Alasmidonta minor*
†6. *Ellipsaria fasciolaris*
†7. *Obovaria subrotunda levigata*
†8. *Medionidus plateolus*
†9. *Eurynia trabalis*
†10. *E. nebulosa*
11. *Lampsilis ovata ventricosa* (seen)
†12. *L. fasciola*

TENNESSEE PROPER, AT AND BELOW KNOXVILLE.

Tennessee River, at and above Knoxville, Knox Co., Tenn.

‡ = according to Pilsbry & Rhoads; † = Carn. Mus. (Ortmann, Sept. 22, '15; B. F. = Brabson Ferry, and D. I. = Dickerson Island).

‡1. *Fusconaia pilaris*
‡2. *F. barnesiana tumescens*
†3. *Quadrula pustulosa* (B. F.)
‡4. *Rotundaria tuberculata*
‡†5. *Plethobasus cooperianus* (B. F.)
†6. *Pleurobema obliquum* (B. F.)
‡7. *P. obliquum rubrum*
‡8. *P. oviforme holstonense*
‡†9. *Elliptio niger* (D. I.)
‡10. *E. dilatatus*
‡11. *Lasmigona costata*
‡12. *Ellipsaria subtenta*
‡13. *Dromus dromas*
‡14. *Obovaria subrotunda*
‡†15. *Nephronaias ligamentina gibba* (D. I.)
‡16. *N. pectorosa*
†17. *Plagiola lineolata* (B. F.)
‡†18. *Proptera alata* (B. F.)
‡19. *Lampsilis ovata*
‡20. *Truncilla triquetra*
‡21. *T. haysiana*
‡22. *T. propinqua*

Tennessee River, three miles below Knoxville, Knox Co., Tenn.

Carn. Mus. (Ortmann, Sept. 21, '15).

1. *Fusconaia pilaris*
2. *F. pilaris lesueuriana*
3. *Quadrula pustulosa*
4. *Q. metanevra*
5. *Rotundaria tuberculata*
6. *Plethobasus cooperianus*
7. *Pleurobema obliquum*
8. *Pleurobema obliquum rubrum*
9. *Elliptio niger*
10. *E. dilatatus*
11. *Dromus dromas*
12. *Nephronaias ligamentina gibba*
13. *Plagiola lineolata*
14. *Eurynia recta*

Tennessee River, Little River Shoals, Knox Co., Tenn.

* = Walker coll.; ‡ = according to Lewis.

*1. *Fusconaia barnesiana tumescens*
*2. *Pleurobema obliquum*
*3. *P. oviforme*
*4. *P. oviforme holstonense*
*5. *Elliptio dilatatus*
*6. *Lasmigona costata*
*7. *Nephronaias ligamentina gibba*
*8. *Eurynia fabalis*
‡9. *Truncilla lewisi*

Tennessee River, Concord, Knox Co., Tenn.

‡ = according to Lewis; † = Carn. Mus. (Ortmann, Sept. 9, '14).

†1. *Quadrula pustulosa*
†2. *Rotundaria tuberculata*
‡3. *Pleurobema oviforme holstonense*
†4. *Elliptio niger*
†5. *Strophitus edentulus*
†6. *Nephronaias ligamentina gibba*
†7. *Eurynia recta*

Tennessee River, Chota Shoals, Knox Co., Tenn.

Walker coll.

1. *Fusconaia cuneolus appressa*
2. *F. barnesiana*
3. *Pleurobema oviforme holstonense*

Tennessee River (or "Holston River"), Knox Co., Tenn.

(Summary of all species reported from the region between Brabson Ferry and Chota Shoals, mostly without exact locality.)

‡ = according to Lewis; § = reported by Pilsbry & Rhoads; * = Walker coll.; † = Carn. Mus. (Hartman coll. (H.), and Smith coll. (S.)); those reported above are marked: B. = Brabson Ferry; D. = Dickerson Island; K. = Knoxville; L. = Little River Shoals; Co. = Concord; Ch. = Chota Shoals.

‡1. *Cumberlandia monodonta*
‡§†2. *Fusconaia pilaris*—K.
‡†3. *F. pilaris lesueuriana*—K.
‡4. *F. cuneolus* (?)
*5. *F. cuneolus appressa*—Ch.
‡6. *F. cor*
‡*7. *F. barnesiana*—Ch.
‡§*8. *F. barnesiana tumescens*—K. L.
‡9. *Amblema plicata costata*
‡†10. *Quadrula pustulosa*—B. K. Co.
‡†11. *Q. metanevra*—K.
‡12. *Q. intermedia*
‡13. *Q. cylindrica*
‡§†14. *Rotundaria tuberculata*—K. Co.
‡§†15. *Plethobasus cooperianus*—B. K.
‡16. *P. cyphyus*
‡*17. *P. cyphyus compertus* (also Frierson)
‡18. *Lexingtonia dolabelloides*
*†19. *Pleurobema obliquum—B.K.L.*
‡20. *P. oliquum cordatum*
‡§†21. *P. obliquum rubrum*—K.

‡*22. *P. oviforme*—L.
‡§*23. *P. oviforme holstonense*—K. L. Co. Ch.
‡§†24. *Elliptio niger*—D. K. Co.
‡§*†25. *E. dilatatus*—K. L.
‡26. *Lastena lata*
‡§*27. *Lasmigona costata*—K. L.
‡28. *Alasmidonta marginata*
‡†29. *Strophitus edentulus*—Co.
‡30. *Ellipsaria fasciolaris*
‡§31. *E. subtenta*—K.
‡32. *Obliquaria reflexa*
‡†33. *Cyprogenia stegaria* (H.)
‡§†34. *Dromus dromas*—K.
‡35. *Dromus dromas caperatus*
*†36. *Obovaria retusa* (S.)—K.
‡§37. *O. subrotunda*—K.
‡§*†33. *Nephronaias ligamentina gibba*—D. K. L. Co.
‡§39. *N. pectorosa*—K.
‡40. *Amygdalonaias truncata*
‡†41. *Plagiola lineolata*—B. K.
‡42. *Paraptera leptodon*
‡43. *P. fragilis*
‡§†44. *Proptera alata*—B. K.
‡45. *Toxolasma lividum*
‡46. *Lemiox rimosus*
‡47. *Medionidus plateolus*
‡*48. *Eurynia fabalis*—L.
‡49. *E. nebulosa*
‡50. *E. vanuxemensis*
‡†51. *E. recta*—K. Co.
‡§52. *Lampsilis ovata*—K.
‡53. *L. fasciola*
*54. *L. orbiculata*
‡§55. *Truncilla triquetra*—K.
‡56. *T. arcæformis*
‡57. *T. interrupta*
*58. *T. lenior*
‡§59. *T. haysiana*—K.
‡†60. *T. stewardsoni* (H.) (S.)
‡61. *T. lewisi*—L.
‡§†62. *T. propinqua* (S.)—K.
‡†63. *T. torulosa* (H.)—K.
‡†64. *T. capsæformis* (H.)

Anodontoides ferussacianus, reported by Lewis (as *Anodonta oblita*), has probably been misidentified. Also *Fusconaia cuneolus* is doubtfully given by Lewis; however, it may occasionally turn up in this region.

Tennessee River, Hiwassee Island, Dayton, Rhea Co., Tenn.

Walker coll. (Adams, Oct. 13, '01).

1. *Amblema plicata costata*
2. *Pleurobema obliquum*
3. *Elliptio niger*
4. *Elliptio dilatatus*
5. *Ellipsaria fasciolaris*

Tennessee River, Rathburn, Hamilton Co., Tenn.

Walker coll. (Adams).

1. *Quadrula pustulosa*
2. *Rotundaria tuberculata*
3. *Lexingtonia dolabelloides*
4. *Pleurobema obliquum cordatum*
5. *P. obliquum rubrum*
6. *P. oviforme holstonense*
7. *Elliptio niger*
8. *E. dilatatus*
9. *Obliquaria reflexa*
10. *Cyprogenia stegaria*
11. *Dromus dromas*
12. *Plagiola lineolata*

Tennessee River, Chattanooga, Hamilton Co., Tenn.

‡ = according to Pilsbry & Rhoads; * = Walker coll. (Adams, Oct. 22, '01; † = Carn. Mus. (Juny coll.).

‡1. *Quadrula pustulosa*
*2. *Q. metanevra*
‡3. *Plethobasus cooperianus*
‡4. *Pleurobema obliquum*
‡5. *P. oviforme holstonense*
‡6. *Elliptio niger*
‡7. *Elliptio dilatatus*
‡8. *Ellipsaria fasciolaris*
‡*9. *Dromus dromas*
‡10. *Nephronaias ligamentina gibba*
†11. *Truncilla torulosa*